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An Appraisal of the Advertising Analysis and Conclusions in the "Health or Tobacco" report from the Toxic Substances Board of New Zealand

A report prepared by
Dr. L.W. Hagan, M H Gamma Consulting Ltd.
D. Martin, M H Gamma Consulting Ltd.
in conjunction with M.J. Waterson, U.K. Advertising Association

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Section 1: Introduction

An analysis of Chapters 6, 7 and 8 of the Toxic Substances Board (TSB) report was commissioned by the Tobacco Institute of New Zealand on June 16th for delivery on July 7th.

In order to critically appraise the TSB report a substantial quanitity of data had to collected from many different sources. Infotab played a key and enormously helpful role with this data collection. Nevertheless a sufficiently comprehensive data set was not acquired until July 3rd, leaving 5 days for the computer analysis, report finalisation, writing, and production.

This time scale was obviously too short to produce a fully comprehensive analysis of the TSB report. Nevertheless we believe that the enclosed analysis does adequately review the more controversial points which are made in Chapters 6, 7 and 8.

Dr. L. Hagan
D. Martin
M.J. Waterson
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Section 2: Summary

The TSB report is an extensive document which contains a great deal of statistical material, analysis and comment. The report, although substantial, and visually very well presented, contains a great many errors. These errors are of five basic types.

First, the authors of the report have made some fundamental assumptions about how advertising works. These assumptions are almost all demonstrably wrong.

Second, the report uses a great deal of market survey data to justify the conclusions reached. Market survey data covering tobacco consumption is always prone to very considerable error. This is a matter of fact not opinion. The large error to which the data is subject invalidates all conclusions drawn from this source.

Third, the report uses tobacco consumption data in a selective and partial manner.

Fourth, the report bases many of its judgements on a small scale literature review which leaves out of consideration some of the most important contributions to the debate. Crucially, the report does not include mention of previous literature reviews. This is a serious omission.

Fifth, the report contains a large number of what can only be called mistakes, of various types, ranging from the evident lack of appreciation of simple statistical practices, to the inclusion in the report of contradictory statements.

Individually these errors all invalidate large sections of the TSB report. Collectively they mean that none of the report's conclusions can be regarded as reasonable basis for decision making.

Despite the innumerable flaws which render the conclusions of the TSB report quite untenable, and therefore unusable from a policy making standpoint, the authors have managed to assemble a useful database. Some of the TSB data, when used with conventional statistical techniques (as opposed to the unconventional and incorrect techniques used by the TSB report's authors) can be used to provide useful and realistic conclusions.

As part of this appraisal of the TSB report a re-analysis of the TSB data has been undertaken. This re-analysis provides firm evidence that:

(1) Advertising bans and restrictions have little or no impact on the consumption of tobacco products.

(2) Advertising bans do impede the growth of the market share of filter cigarettes (and hence probably also the growth of low tar cigarette types).

These conclusions are broadly in line with the results of literature reviews undertaken by independent Government agencies and academics who have reviewed the evidence relating to the impact of advertising in general terms and of tobacco advertising in particular.

To conclude, the TSB report is an ambitious attempt at producing a definitive answer to the question of what impact tobacco advertising has on tobacco consumption.

Unfortunately the report is riddled with untenable assumptions, contradictions and errors. Conclusions are built upon the shifting sands of faulty data analysed by faulty statistical methods.

Despite these problems some useful data has been assembled by the TSB authors which when analysed using appropriate statistical methods provides a firm basis for believing that advertising bans and controls are extremely unlikely to influence tobacco consumption trends. This is particularly likely to be so in the case of New Zealand. Data provided in great detail in this report, from all available sources, demonstrates that tobacco consumption has fallen faster in New Zealand than in any country that has instituted a tobacco advertising ban - for whatever reason - over the period since 1975. Over the entire period since the tobacco advertising ban in Norway in 1975, consumption in New Zealand has fallen at more than twice the rate it has fallen in Norway.

Section 3: The Approach Adopted

The Toxic Substances Board report is an extensive document containing many observations, statistics and analyses. The main conclusions regarding advertising have been drawn from three quite different sources.

First, conclusions have been drawn from a set of beliefs and assertions regarding how advertising works; second from various literature searches; and third, from a study of advertising policies and tobacco consumption trends in 33 countries.

In appraising the report we first looked at the entire document. We have identified certain deficiencies in methodology, some errors and omissions, and a variety of other problems that we believe exist and which detract from the report's usefulness.

We conducted an international literature search in order to bring together data and evidence from all sources available at the time of writing, including a number of key sources not utilised by the TSB authors. This evidence, combined with evidence deriving from the previous stage of research allowed conclusions to be drawn regarding the incomplete nature of the information and analyses used in the TSB report.

We then undertook a rigorous examination of the data presented in the TSB report.

Finally, we have attempted to produce an overall review of the validity of the TSB evidence in the light of identified error, our own re-analysis of TSB data, and our worldwide literature searches.

Section 4: A Review of Chapters 6, 7 and 8 of the TSB Report

The chapters of the TSB report that deal with advertising suffer from five basic types of error.

First, the report makes many fundamental assumptions about how advertising works, which are demonstrably quite wrong. This basic error colours the whole document and leads to many false conclusions.

Second, the report uses a great deal of data which can be shown to be highly misleading. Many of the reports conclusions are thereby invalidated.

Third, although the report also uses a great deal of data which is valid, the authors of the report appear to have used these data in a selective and partial manner, thereby invalidating much of the useful work done.

Fourth, the report draws on a wide literature. Unfortunately, useful though the survey is, many key articles, and in particular reviews of the relevant literature, have been ignored. This has led to a great deal of confusion and error.

Fifth, the report contains many small errors, methodological faults and factual mistakes. Individually few of these transgressions are of consequence. Collectively they invalidate many of the conclusions drawn.

This section of our report deals with each of these basic types of error in turn.

4.1 Fundamental Assumptions Made by the TSB Report

The TSB report contains many statements that reflect the fundamental assumptions made by the authors about how advertising works.

For example:

> *"the reason that monopolies advertise* ***must be*** *(emphasis added) to expand market size"*

> *"In the United States in 1987 manufacturers spend 1.66 billion dollars on advertising tobacco. It is* ***inconceivable*** *(emphasis added) that promotion on this scale has no effect on total sales."*

"Commonsense (and empirical evidence) would also argue that when soap manufacturers promote many different brands of soap, they also promote overall soap sales - and cleanliness. A corollary, then, suggests that when tobacco manufacturers advertise and promote many brands of tobacco for smoking, overall tobacco sales are also promoted."

"Tobacco advertising expenditure can be economically justified by generating extra sales, either from

(1) current smokers switching to the advertised brand, or

(2) ex-smokers taking up smoking again, or

(3) current smokers being persuaded to smoke more cigarettes, or

(4) more new young smokers being persuaded to start than would have otherwise.

Detailed calculations show that tobacco manufacturers are now probably spending in excess of ten times more per year on advertising than they are likely to gain in the same time by brandswitching. Brandswitching, the industry's justification for advertising, accounts for only 7 percent of the economic return from maintaining tobacco advertising and sponsorship. This is the best estimate of the situation in the light of information that is currently available in the public domain. The conclusion is that over 90 percent of the tobacco advertising expenditure can only be recouped if tobacco advertising increases the number who smoke, particularly by attracting new smokers to smoking."

These statements are intuitively appealing. However, they reflect a view of advertising which is demonstrably a long way from the hard reality known to the thousands of marketing executives who use advertising as a day-to-day tool of their trade.

Explaining to non-marketing people the exigencies of 'life at the coalface' in a competitive consumer market is a difficult and lengthy business. Appendix 1 *'The Role of Advertising'* attempts to explain why advertising is used, and what it can and cannot do. Although such an explanation of the marketing process is necessary to place fully in context the erroneous nature of the TSB assumptions, it is not necessary in order to demonstrate that the TSB's statements are wrong.

The first part to note in this context is that the TSB advances very little evidence in support of its highly tendencious claims. No evidence is put forward to support the massively broad claim that the reason monopolies advertise must be to expand market size, other than a table showing the large (but not complete) market share of monopolies in these countries. No reference is made to the very small absolute amounts spent on advertising in these countries. No reference is made to the obvious

desire of monopolies to keep import sales down, or to announce to consumers new, perhaps higher margin, products. And so on.

No evidence is put forward to support the claim that the tobacco advertising expenditure in the USA **must** influence sales in total. Only one ancient and much criticised study is put forward to support the argument that soap advertising promotes soap sales. No evidence at all is given to support the assertion that "over 90% of tobacco advertising can only be recouped if advertising increases the number who smoke."

There is however a great deal of evidence (nowhere mentioned in the TSB report) to support the view that advertising expenditure is unlikely to influence the total size of large mature markets or indeed the economy as a whole.

A number of reviews of this large body of evidence have been conducted in recent years, by totally independent Government employees, researchers and academics.

For example, a recent Federal Trade Commission *Bureau of Consumer Protection* review of the available literature (including the Comanor & Wilson's study quoted by the TSB) relating to the subject:

> *"A number of studies use statistical techniques and real world data to test for the effect of advertising on total consumption in each of many industries over a period of a decade or longer. These studies generally estimate the effect of advertising on consumption while using statistical techniques to hold constant the effects of variables such as industry price and consumer income. Because price is held constant, the results of these studies can be interpreted as estimates of the effect of advertising on consumer demand for an industry's product.*
>
> *"We reviewed the most important of these studies as well as other reports that survey this literature. **The large majority of such studies found little or no effect of advertising on total industry demand**(emphasis added).*
>
> *"The principal exception of this generalization is a controversial study by Comanor & Wilson, for which the principal results cover 28 industries during 1948-64. Comanor & Wilson found that advertising had a significant positive effect on industry demand in 10 industries. **This study and its results have been widely criticised** (emphasis added). One problem is the use of IRS data for advertising expenditures. Grabowski (1976) used different advertising data and found no impact of advertising on total demand."*

There is also a great deal of evidence deriving from the impact of advertising in industry sectors comparable in terms of economic maturity with the tobacco industry. Here again the evidence conflicts totally with the TSB position.

For example, a very recent and extremely comprehensive review of the literature relating to the impact of advertising in the alcohol market by a researcher from the Addiction Research Foundation in Toronto found that:

> *"The evidence indicates that advertising bans do not reduce alcohol sales, total advertising expenditures have no reliable correlation with sales of alcoholic beverages, **and that experimental studies typically show no effect of advertising on actual consumption**" (emphasis added).*

Further reviews of the evidence is this area are given in the Appendices to this report. It is clear that the use of only the Comanor & Wilson work as "evidence" constitutes a serious flaw in the report and leads to conclusions being drawn which are the reverse of those drawn by larger and more adequate reviews of the evidence.

It is also clear that the use of language such as 'must be' and 'inconceivable' is inappropriate in a supposedly serious appraisal of this subject. Opinion, no matter how firmly held, does not constitute evidence.

The claim that over 90% of advertising money is necessarily devoted to total market expansion rather than brand competition is perhaps the most extraordinary statement made in the whole report. It is very difficult to take seriously such a claim.

To reject such a claim it is only necessary to look at the endlessly shifting brand share and advertising expenditure patterns in almost all markets (many of which are static or declining) to see that if the TSB statement were true a very large proportion of advertising expenditure would be totally wasted. It is simply a fact that the vast majority of advertising is aimed directly at increasing the sales of individual brands, without any reference to the total market in which the brands operate. It is a fact that the entry of a new brand - such as the new brands of Australian lager beer that were introduced into the UK some years ago - can play havoc with existing brand shares. The Australian lager brands now take a very large share of the total UK beer market. Using competitive brand advertising combined with other factors, the Australian brewers have carved out a market worth many hundreds of millions of pounds a year, in a market in overall decline. The companies involved have gained massively from their endeavours. Yet they have neither tried to, or succeeded in, expanding the UK beer market.

To summarise, the TSB report betrays a total lack of understanding of how consumer markets operate, and the role of advertising within these markets. Furthermore the TSB report has advanced no serious evidence in support of its case and has failed to take into account or consider in any way the large body of evidence now available from totally independent sources which contradicts the views advanced by the TSB.

This flaw in the report is very serious and alone, in the opinion of the authors of this appraisal, is sufficient to invalidate many of the reports findings.

4.2 Misleading Data Used in the TSB Report

In the report 'Health or Tobacco' the TSB makes extensive use of survey data which purports to describe tobacco consumption.

For example in Table 8.3.3 of the TSB report, actual consumption data is given which describes the fact the tobacco consumption per adult has fallen faster in New Zealand (-1.9%p.a.) over the period 1976-86 than it has in Norway (-0.8%p.a.) or Finland (-0.8%p.a.). Further data is then given showing that 'Daily Smoking in Youth' and 'Daily Smoking in Adults' has in Norway fallen far faster (-3.2% and -2.5% respectively) than in New Zealand (-0.3% and -1.7%). There is obviously an inherent contradiction in these two sets of data.

If daily smoking by youth and adults has apparently fallen far faster in Norway than in New Zealand, yet total consumption has actually fallen far faster in New Zealand than in Norway, it would indicate that one or other data set is wrong.

The fact is that all survey data covering tobacco consumption is highly suspect. It is a simple matter of fact (and therefore not a matter of opinion) that survey methods (asking people about their smoking behaviour) provide very different results to the alternative methods (favoured by Trade Associations, taxation authorities and others who need to know the facts with precision) which involve observing actual behaviour as documented in official statistics.

It is a fact that survey data does not and cannot gross up to national consumer levels described (for example) by government statistics compiled for taxation purposes. The reason is simple. People tend to lie in response to questions about their smoking habits (and drinking habits) to a far greater extent than is the case with market survey data in other less emotive areas.

Survey evidence usually manages to document between 30% and 70% of total national consumption levels for such products thereby rendering useless any attempt at drawing conclusions such as those formed in tables 7.5.1a and 7.5.1b of the TSB report.

The fact is that tobacco consumption has fallen far faster in New Zealand than in Norway over the period since advertising has banned in Norway. Had smoking behaviour amongst Norwegian youth really radically changed following the advertising ban (now fourteen years ago) the effects would be clearly visible in the national statistics. They are not.

The TSB report relies in very large measures on such totally inadequate survey data. A great deal of the 'evidence' presented in chapters 6, 7 and 8 is therefore totally invalidated as serious evidence.

4.3 The Selective and Partial use of National Tobacco Consumption Data

The authors of the TSB report have used real tobacco consumption data in the report in addition to the survey data described in section 4.2 above. They often (improperly) reject the evidence of this data in favour of conclusions drawn from inaccurate survey data, but nevertheless they have accumulated an interesting body of real consumption data.

Unfortunately the authors of the report have not accumulated enough data to serve correctly their purpose.

The methodology used in general is to compare trends after a ban with trends in other countries where a ban has not taken place. No account has been taken of the trends in the ban countries before the ban took place, which is of course crucial information. One cannot interpret a claimed difference between groups of countries after a ban in one group, unless one can demonstrate the difference was not evident before the ban.

The importance of seeing the 'whole picture' is illustrated by the table attached (table 4.1) which shows per capita consumption for all OECD countries. As can be seen from the table (which also assembles hard consumption data for each country from all known sources) on any measure or data source used, those countries which have achieved the greatest falls in tobacco consumption allow tobacco advertising. (These data are also given by data source in Appendix 2).

New Zealand has achieved a greater fall in tobacco consumption than any of the countries which have had advertising bans in place, in some cases for many years.

To summarise the use of data runs covering only post-ban situations is a major flaw in the TSB report. This omission invalidates several key TSB conclusions.

In addition to this misuse of data, the TSB report omits certain very important figures which are easily available but whose omission greatly affects the overall conclusions. For example, one of the key conclusions of the report, based on national consumption data, relies wholly on data from Portugal for the years 1983-1986. Adding to the report data for 1987 radically alters the conclusions that would have been drawn. The short data run used and the omission of recent but available data is a key error in the report which invalidates one of its major findings. (More information on this key point is contained in Section 5).

Table 4.1 Per Capita Tobacco Consumption Trends in OECD Countries With and Without a Tobacco Advertising Ban.

		1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	% Change from 1975
	Netherlands	3060	2770	3060	2430	3010	2730	2050	2020	2160	1560	1690			44 77
	UK	3286	3191	3009	2906	2862	2716	2411	2170	2064	2028	1950	1885	1827	44 42
	Netherlands	1748	1635	1940	1683	1908	1586	1501	1476	1372	1146	1074	1048	1031	41 05
	Netherlands	1748	1635	1940	1683	1908	1624	1487	1546	1358	1160	1074	1092	1041	40 45
	Netherlands	1749	1634	1941	1693	1895	1555	1495	1488	1531	1186	1083			38 05
	Belgium/Lux	2031	1987	1950	1761	1892	1913	1935	2088	1723	1538	1611	1386	1280	36 99
	UK	3210	2970	2950	3020	2840	2750	2470	2270	2180	2180	2120			33 96
	Ireland				2331	2257	2211	2119	1952	1865	1806	1759	1663	1589	31 84
	Ireland	2366	2319	2218	2293	2286	2205	2091	1925	1854	1785		1638	1581	31 06
	Belgium/Lux	2501	2448	2504	2423	2588	2595	2633		2143	2015	1897	1818	1768	29 33
	UK	2359	2324	2241	2229	2211	2158	1956	1811	1802	1761	1743	1682	1669	29 26
	UK	2600	2500	2400	2600	2500	2500	2100	2100	2100	2100	2000	2000	1900	26 92
	Ireland	3490	3240	3110	2940	2910	2890	2750	2870	2870	2630	2560			26 65
2	Canada	2563	2605	2641	2616	2666	2679	2729	2692	2531	2456	2330	2189	2043	20 28
0	Canada	2586	2686	2708	2661	2727	2680	2729	2743	2578	2462	2343	2178	2072	19 85
7	New Zealand	2018	2000	2028	2003	1954	1906	1954	1920	1887	1835	1724	1593	1620	19 72
	Iceland	1402	1399	1268	1258	1275	1256	1288	1261	1274	1269	1192	1146	1132	19 23 a
2	Canada	2512	2636	2653	2660	2688	2680	2729	2695	2532	2468	2339	2183	2051	18 38
1	Belgium Lux		2380	2260	1990	2130	2230	2080	2390	2140	1910	1990			16 39
6	USA	2811	2814	2802	2767	2762	2773	2781	2727	2555	2533	2482	2416	2353	16 30
10	USA				2759	2727	2725	2773	2641	2545	2523	2486	2413	2366	14 27
25	Belgium Lux	2031	1987	1949	1761	1892	1913	1935	2134	2080	2041	1918	1852	1745	14 12
21	Australia	2301	2213	2280	2290	2352	2382	2310	2135	2089	2112	2199	2129	2042	11 26
10	Australia	2315	2127	2286	2298	2274	2394	2357	2279	2214	2208	2065	1976	2066	10 76
1	Sweden	1860	2030	1770	1790	1920	1950	1770	1790	1780	1790	1660			10 75
1	Germany FR	2660	2650	2330	2500	2530	2610	2540	2200	2280	2350	2380			10 53
10	Finland	1719		1388	1391	1360	1356	1384	1717	1466	1536	1469	1468	1559	9 32 a
23	Finland	1714	1351	1389	1391	1456	1476	1378	1430	1466	1537	1387	1465	1555	9 28 a
2	Finland	1719	1354	1393	1389	1448	1485	1375	1429	1462	1536	1387	1464	1561	9 18 a
1	Finland	1880	1540	1640		1890	1840	1870	1700	1820	1910	1720			8 51 a
10	Japan	2633	2435	2669	1749	2684	2661	2604	2640	2606	2594	2560	2541	2415	8 25
28	Norway	2050	1995	2012	1995	2044	1980	1942	1834	1836	1841	1889	1876		7 85 a
2	Sweden	1428	1459	1382	1414	1411	1432	1382	1453	1393	1379	1341	1338	1322	7 47
1	Norway	760	730	770	730	810	850	700	700	540	580	710			6 58 a
2	Iceland							1926	1778	1844	1863	1805	1770	1800	6 56 a
5	Norway	1581	1519	1573	1487	1566	1629	1553	1413	1434	1451	1515	1534	1504	4 90 a
2	Germany FR	2004	2080	1888	1984	2014	2063	2104	1760	1851	1924	1952	1922	1923	4 03

Table 4.1 Per Capita Tobacco Consumption Trends in OECD Countries With and Without a Tobacco Advertising Ban.

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	% Change from 1975
Portugal	1800	1660	1750	1760	1840	1780	1800	1800	1870	1730	1730			3 89
Denmark	1707	1779	1766	1750	1633	1590	1567	1714	1646	1745	1741	1701	1647	3 52
Germany FR	1997	2080	1863	1979	2028	2084	2092	1815	1930	1951	1973	1924	1930	3 34
Switzerland		3050	3300	3170	3620	3680	2710	3190	3120	2880	2960			2 95
Switzerland	2420	2416	2517	2432	2362			2474	2515	2490	2418	2404	2402	0 75
Germany FR	2041	2098	1891	2011	2054	2085	2112	1855	1917	2005	2021	1994	2028	0 65
Denmark	1403	1478	1454	1430	1446	1405	1386	1524	1427	1506	1525	1465	1404	0 02
Sweden	1425	1458	1376	1417	1441	1431	1380	1449	1447	1462	1356	1418	1430	0 38
Denmark	7100	7500	7400	7300	7400	7200	7100	7800	7300	7700	7800	7500	7200	1 41
Iceland	3020	2820	2850	3130	3220	3240	3240	3200	3160	3130	3100			2 65 a
Switzerland	2419	2419	2518	2431	2368	2409	2440	2473	2548	2520	2521	2414	2499	3 32
France	1609	1582	1626	1591	1640	1628	1608	1615	1635	1660	1746	1708	1693	5 24
Portugal				1373	1339	1324	1378	1442	1473	1451	1441	1451		5 71
Turkey	1294	1344	1372	1176	1102	1144	1434	1330	1284	1296	1276	1280	1375	6 26
Italy	1601	1611	1620	1583	1720	1749	1787	1879	1908	1861	1978	1839	1716	7 18 a
Portugal	1350	1285	1350	1340	1304	1291	1347	1378	1435	1410	1409	1420	1449	7 39
Ireland		1642	1620	1647	1996	2205	2105	1925	2012	1852	1808	1771		7 84
Italy	1600	1610	1620	1582	1720	1750	1786	1794	1799	1830	1843	1774	1727	7 93 a
Italy	3202	3222	3240	3165	3440	3499	3573	4110	3596	3660	3687	3660	3459	8 05 a
Austria	1845	1905	1943	2000	2076	2055	2078	2053	2142	2046	2141	2048	1995	8 15
France	1560	1536	1579	1545	1599	1590	1502	1585	1636	1659	1744	1708	1694	8 58
France	1558	1535	1577	1546	1640	1568	1576	1586	1606	1632	1717	1686	1692	8 58
Austria	1847	1903	1942	1997	2080	2053	2075	2047	2052	2065	2064	2062	2007	8 63
Austria	2350	2500	2600	2670	2700	2670	2550	2680	2650	2510	2560			8 94
Austria	1844	1905	1943	2000	2076	2055	2078	2053	2102	2059	2070	2064	2011	9 06
France	2170	2150	2060	2130	2170	2080	2050	2050	2070	2090	2400			10 60
Portugal	1380	1316	1376	1467	1348	1339	1381	1412	1492	1434	1431	1406	1531	10 95
Italy	2120	2180	2170	2090	2250	2320	2180	2390	2410	2370	2460			16 04 a
Greece	3130	3250	3350	3480	3470	3420	3590	3370	3340	3500	3640			16 29
Spain	1751	1920	1994	1884	2024	2046	1907	1844	1692	1973	2023	1987	2081	18 83
Spain	1643	1761	1837	1725	1896	1884	1701	1810	1864	1935	2052	2015		22 64
Denmark	1324	1400		1450	1427	1374	1386	1524	1646	1730	1725	1668	1628	22 96
Spain	1669	1783	1861	1742	1914	1899	1734	1822	1875	1944	2064	2020	2067	23 83
Greece	2380	2485	2255	2660	2636	2641	2724	2623	2621	2766	2826	2900	2952	24 01
Greece	2373	2486	2556	2645	2609	2309	2413	2624	2702	2847	2911	3009	2959	24 72
Spain	2110	1600	1900	1800	2030	2320	2360	2460	2260	2620	2740			29 86
Greece	2089	2182	2245	2322	2294	2271	2415	2625	2701	2848	2909	3010	2961	41 70
Norway								425	426		567	627		47 59 a
Norway	438	427	484	456	501	546	487	425	428	471	555	630	655	49 52 a
Norway		422	495	468	491	538	488	437	436	459	554	624	645	52 83 a

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16. Singapore Department of Statistics, Ministry of Trade and Finance, Cigarette Consumption per Capita
17. Norway Customs and Excise, Sales per Capita
18. Statistiche Bundestamt Wiesbaden, Finanzen und Sterun, Reihe 9 1 2 Tabakgewerbe, 1987, Cigarette Consumption per Capita
19. Austria Tabak, Cigarette Consumption per Capita
20. Tobaksindutrein, Cigarette Consumption per Capita
21. Australian Tobacco Board Annual Report, Cigarette Consumption per Capita
22. Canadian Tabacco Manufacturers' Council, Cigarette Consumption per Capita
23. Finnish Tobacco Manufacturers' Association, Cigarette Consumption per Capita
24. Tobacco Institute of Hong Kong Ltd, Estimate Cigarette Consumption per Capita
25. Belgische en Luxemburges fiskale bandjes, aangekocht voor in Belgie en in Luxembourg Units Cigarette consumption per Capita
26. Officio Studi Federazione Italiana Tabaccai, Units Cigarette Consumption per Capita
27. New Zealand Customs Department, Consumption of Cigarettes per Capita
28. Norwegian Customs & Excise Directorate, per Capita Consumption in Grammes per Capita Over 15
29. SEITA Cigarette Consumption Units per Capita

Note.

1. Countries Ranked by % Changed since 1975
2. Where incomplete data exists % change figures relate to available period
3. All Data in the last column ie derived from the data shown in the table
4. All population data is from OECD Historical Statistics 1960 1987
5. Were Consumption Data was given in Units of Mass, the conversion 1 cigarette = 1 gramme was used to obtain Consumption in pieces
6. WHO Data is Defined as Consumption of manufactured Cigarettes per adult,
   as the population base is different from the OECD source diffrences can be expected
7. IARC data, see source 3 above, is available from the master database but does not appear
   on this table due to its out of date and fragmentary nature
8. α Country with a ban on tobacco advertising

4.4 The TSB Literature Base on the Impact of Advertising on Tobacco Consumption

The authors of the TSB report have assembled a number of studies relating to the subject under discussion. Unfortunately they have failed to find a significant number of research reports which are of substantial importance.

Of most particular interest in this debate, which involves the assessment of highly technical literature, some of which is associated with 'sponsors', is the opinion of previous reviewers of the literature, particularly when they are clearly independent of outside interests.

The authors of the TSB report located 14 relevant studies, but no independent literature reviews are quoted. They concluded that eleven of the fourteen studies showed that advertising "significantly affected national cigarette sales."

The TSB selection of available studies is, unfortunately, most inadequate. It is inadequate in that it excludes some of the most important studies. It is inadequate in that is has failed to examine the several major literature reviews now available. It is inadequate in that it has failed to examine evidence from studies of similar industries (notably, alcohol, where a wealth of material is available).

Finally the TSB literature survey is inadequate because the conclusions reached are highly dependent on the results of five studies (Comanor & Wilson; McGuinness and Cowling, Radfar, Reuijl and Chetwynd) all of which have been the subject of serious criticism, and one (Meads) as yet unpublished study.

Econometric studies have been used in the tobacco advertising debate on a 'quantity' as opposed to a 'quality' basis. Reports have been frequently left much to be desired. It is therefore very disappointing to find that such a partial and incomplete selection of material has been made by TSB.

It is particularly disappointing that the TSB selection fails to reflect the conclusions reached by Government agencies in other countries where rigorous analysis of the subject has been recently undertaken.

For example, to quote the recent US FTC Bureau of Consumer Protection report:

> *"We have reviewed the empirical literature on cigarette advertising and consumption because the cigarette market provides an opportunity to study important issues that are not covered in detail in general and/or alcohol advertising literature, particularly the effects of an advertising ban and on anti-consumption ads and other forms of health information.*

Statistical Error in the New Zealand Toxic Substances Board Report of May 1989 (Health or Tobacco: An End to Tobacco Advertising and Promotion) and Consequences of the Use of the Erroneous Statistical Procedure.

by

Theodor D. Sterling, Ph.D.
Professor, Faculty of Applied Science
Simon Fraser University
Burnaby, British Columbia, Canada
V5A 1S6 (604) 733-1348

July 18, 1989

SUMMARY

Central to the claims of the Toxic Substances Board (TSB) Report (Health or Tobacco) is that an apparent correlation has been demonstrated between the extent of a country's advertising ban and decrease of cigarette consumption. These claims are based primarily on a study commissioned by the Board and implemented by the New Zealand Department of Health. This study examines the inter-relationship of tobacco advertising and tobacco consumption for 33 countries.

However, it turns out on careful review, that the New Zealand Department of Health Study used the incorrect statistical index to compute annual average rate of change in tobacco consumption in relation to tobacco advertising groups. For the data acquired by the New Zealand Department of Health Study, the median but not the arithmetic mean is the appropriate measure of the expected percent decrease. When the correct statistic is used, the apparent relation between extent of an advertising ban and decrease in tobacco use largely disappears. In fact, based on the data of the 20 advanced economy countries, the smallest decrease in percentage of adult smoking occurs in those countries with no advertising. These findings are similar to those of the major studies of cigarette consumption following a partial or complete ban of cigarette advertising (The Hamilton study of partial advertising bans, the British Advertising Association study, The World Health Organization review of tobacco use, and the International Advertising Association's 16 country study).

CONCLUSIONS OF THE (TSB) REPORT.

Central to the claims of the Toxic Substances Board (TSB) Report (**Health or Tobacco**) is that an apparent correlation has been demonstrated between the extent of a country's advertising ban and a decline of cigarette consumption. These claims differ from findings of previous studies (on the impact of advertising bans) that failed to find a relationship between a partial or a complete ban of cigarette advertising and a decline in consumption of that product. (The Hamilton study of partial advertising bans, the (British) Advertising Association (BAA) study, the World Health Organization (WHO) review of tobacco use, and the International Advertising Association (IAA) 16-country study). The alleged shortcomings of these and a number of other studies are discussed in detail in the TSB Report. A New Zealand Department of Health Study was especially designed and implemented to correct for the claimed errors of previous investigations on the effects of bans of advertising tobacco products on their consumption. That Department of Health Study (NZDHS) utilizes data from a wide range of sources pertaining to 33 countries. However, results of analyzing various subgroups of 30, 20, 19 and 15 of these 33 countries are also reported in support of different claims.

The importance and impact of the conclusions reached in the NZDHS are summarized on pages xxiii and xxiv under the heading "Effects of Banning Tobacco Promotion in Other Countries". Relevant portions are:

> "The inter-relationships of tobacco advertising and tobacco consumption was examined in thirty-three countries in a study commissioned by the Board, and it covered the years 1970-1986. The study showed (Figures K and L) that:
>
> * Government tobacco advertising bans and controls are accompanied by marked rates of fall in tobacco consumption and in tobacco smoking prevalence; in the absence of such control, consumption increases markedly.
>
> * Total advertising bans for health reasons are, on average, accompanied by falls in tobacco consumption four times faster than in partial ban countries.
>
> * The annual rate by which tobacco consumption falls is graduated, with the maximum fall in total ban countries (average: -1.6 percent per year).
>
> * Much slower declines in consumption (-0.4 percent per year) are seen in countries where tobacco promotion has been banned for political reasons or has been permitted in some media.
>
> * In countries where tobacco has been promoted virtually unrestricted in all media, consumption has markedly increased (+1.7 percent per year)."

The key findings of this study are graphically summarized by two Figures, K and L on page xxiv (Reproduced opposite).

Figure K graphically presents the annual average rate of change in tobacco consumption per adult according to tobacco advertising restrictions in force in 33 advanced economy countries between 1970-1986. It appears to show that the greatest change (decline) in tobacco consumption is in those countries where no advertising is permitted for health reasons, is less in countries that restrict advertising, ranging from no advertising for political reasons to permitting advertising in most media (but showing increasing consumption in countries without a ban on advertising.)

Figure L appears to describe the change in percentage of adults smoking for 20 advanced economy countries. Here an even more striking relationship appears between the type and extent of ban of tobacco advertising and the decrease in adults smoking. In countries with no advertising, the average annual percent decrease in tobacco use is 3.6%; for countries where only a few media carry advertising, the annual decrease is 2.5%, and in countries where advertising is permitted in most media or in all media the annual decline is 1.2%.

Figure K is a graphic representation based on Table 7.5.1c and Figure L is a graphic representation based on Table 7.5.1a in Chapter 7 of the text. We now turn to these tables.

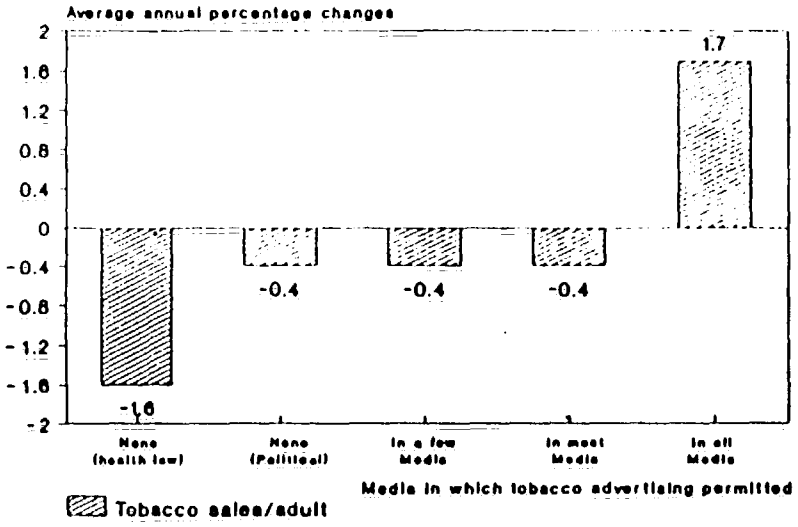
THE NEW ZEALAND DEPARTMENT OF HEALTH STUDY AND ITS FINDINGS.

The method followed by the NZDHS is described in the TSB Report, page 62.

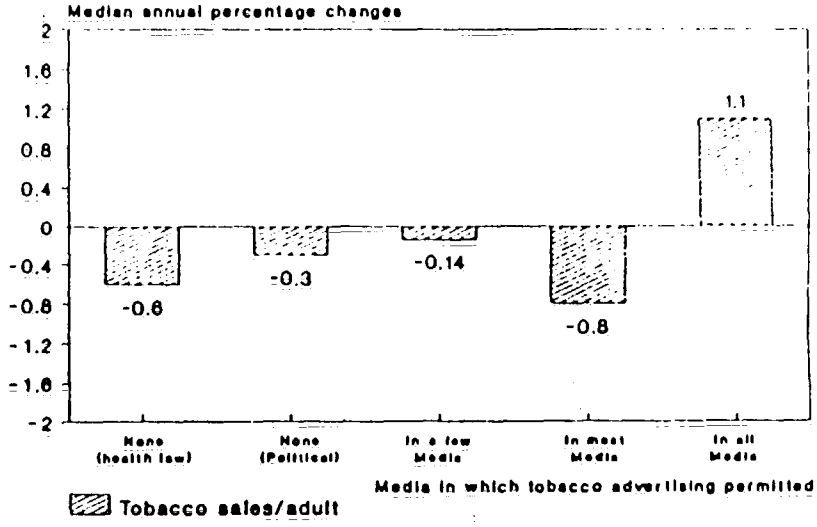
The NZDHS included 33 countries and spanned a 16 year period (1970-1986). It contained official data both on banning or not banning of advertising, cigarette consumption, decline of cigarette consumption and so on.

The degree of "advertising ban" for each country was evaluated on a 10 point scale. Each country was scored for each year on the basis of published smoking control legislation and supplementary information. The scoring system is detailed in the TSB Report's Appendix 4 and allots 0 for no control and a maximum of 10 for elimination of advertising, sponsorship or indirect advertising, accompanied by strong, varied packet warnings. Countries were given an advertising ban score based on application of this scale. According to the report, an attempt was made to obtain reliable data that measured consumption of all tobacco used. Countries were excluded where hand-made cigarettes "confused" the picture, attempts were made to obtain total numbers rather than "weight". It is claimed that allowance was made for supply factors, and for distortion in recorded consumption. Information on tobacco consumption for adults was obtained. Trends for adult smoking were either computed or obtained from existing records.

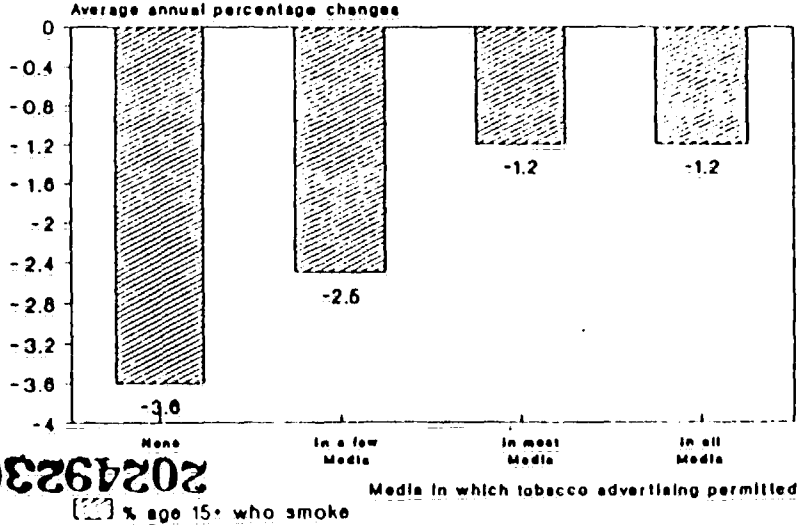
Old Figure K (TSB Report, page XXIV)
Annual Average Rate of Change in Tobacco Consumption Per Adult According to Tobacco Advertising Restrictions in Force 33 Advanced Economy Countries, 1970-86



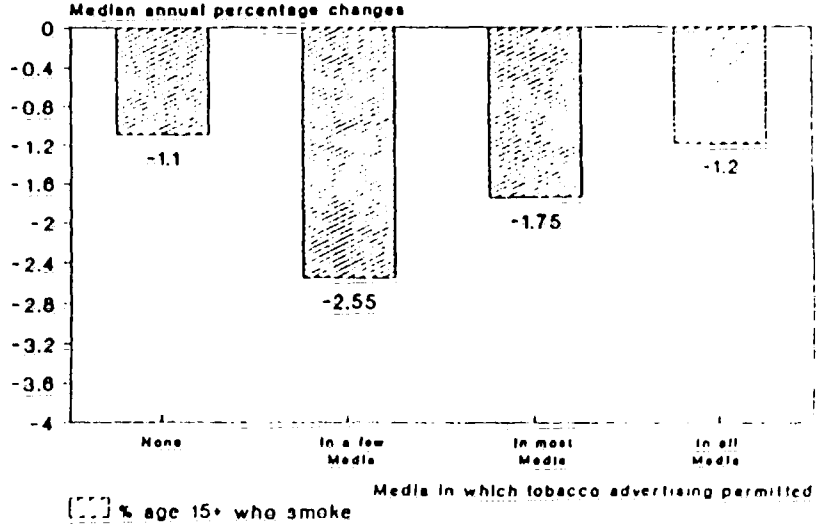
Revised Figure K
Annual Median Rate of Change in Tobacco Consumption Per Adult According to Tobacco Advertising Restrictions in Force 33 Advanced Economy Countries, 1970-86



Old Figure L (TSB Report, page XXIV)
Annual Average Rate of Change in the Percentage of Adults Smoking, According to Tobacco Advertising Restrictions in Force, 20 Advanced Economy Countries, 1970-86



Revised Figure L
Annual Median Rate of Change in the Percentage of Adults Smoking, According to Tobacco Advertising Restrictions in Force, 20 Advanced Economy Countries, 1970-86



Countries were grouped according to their tobacco promotion policy in the years surveyed and the average percent change in annual smoking prevalence calculated for each group of countries. (No attempt was made to age-standardize populations.) While emphasis was placed on adult smoking trends, information was also obtained for smoking trends among young people. Income effect was allowed for as was tobacco price effects. An attempt was made to compare the affordability of tobacco products between countries.*

METHODS USED BY WHICH DATA IN TABLES 7.5.1A AND 7.5.1C SUPPORTED TSB REPORTS CONCLUSIONS.

Table 7.5.1a shows the annual average rate of change in percentage of adults smoking according to tobacco advertising restriction in force for 20 advanced economy countries, for years 1970-1986. Table 7.5.1c shows the change in tobacco consumption per adult for all 33 advanced economy countries.

The groups of countries according to the advertising ban score differ somewhat between these tables.

Table 7.5.1a compares countries that:

1. enforce a tobacco advertising ban;
2. restrict tobacco promotion to a few media;
3. permit tobacco promotion in most media;
4. permit tobacco promotion in all media.

Table 7.5.1c compares countries that:

1. totally ban tobacco promotion for health reasons;
2. do not permit advertising for political reasons; (these were mostly iron curtain countries)
3. permit tobacco promotion in a few media;
4. permit tobacco promotion in most media;
5. permit tobacco promotion in all media.

For each category of tobacco ban score, countries that fell into these categories are listed with year of study and change in tobacco consumption, or change in prevalence, for adults from the beginning to the end of a period for which data are available. The last two columns in the tables list the percent change for each country and compute the "average" change in percent decline of tobacco

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* While I am not concerned here with how much of these aims were accomplished, it is obvious from the TSB Report that these criteria could not be met by all countries. Nevertheless, the authors of the study were satisfied with their data and did not discuss the possible effects on their analysis when conditions or information from selected countries could not be obtained.

consumption or decline in percentage of adults smoking for each group of countries.

The computation of the average is by means of the *arithmetic mean* for which the percentages were first summed and then divided by the number of countries. (i.e. for Table 7.5.1c, for the group "Total-ban on tobacco promotion for health reasons," percent changes were -0.2, -0.4, -0.8, -5.1. To compute the arithmetic mean these four values were summed, yielding a sum of -6.5 and then divided by 4, yielding an arithmetic mean of -1.6 percent change).

Conclusions concerning decline of tobacco consumption in relation to banning of advertising that pertain to the countries and decline in adults smoking are based on the arithmetic means computed in Tables 7.5.1a and 7.5.1c.

However the arithmetic mean is the incorrect statistic for summarizing the percent change in tobacco consumption or change in adults smoking for advertising-ban-score groups. When the correct statistic is used, the apparent relation between extent of an advertising ban and decrease in tobacco consumption or adult smoking disappears and with this disappearance, the conclusions of the Department of Health Study and the TSB Report lose their validity.

A BRIEF DISCUSSION OF MEASURES OF "CENTRAL TENDENCY."

There are a number of measures of central tendency of which the arithmetic mean is only one. Is the arithmetic mean the proper *descriptive statistics* to use in this instance?

The outcome of observations of interest to scientists, statisticians, epidemiologists etc are numerous values about some state of nature. (In this case percent changes in the use of tobacco for different countries.) One of the valuable contributions the science of statistics has made to the analysis of such data consists of methods to calculate indices that can be used to describe aggregates of this data and draw inferences from them.

Indices used to summarize the outcome of observations for particular groups of data usually are called measures of *central tendency* because it always is assumed that observed values are a reflection of some true quantity but differ from that true quantity by chance. Measure of central tendency are estimates of such true values. The most frequent types of measures of central tendency used for scientific description and scientific inference are the *median*, the *arithmetic mean* and the *geometric mean*. (There are also a number of descriptive indices of lesser power which usually are briefly described in most introductory texts on applied statistics.)*

* The meaningfulness of each index of central tendency is enhanced by an accompanying second index which describes the variation of observed value about an estimated true central value. Insofar as data on Tables 7.5.1a and 7.5.1c are not used to compute indices of variations we shall not further discuss them.

For the data in Tables 7.5.1a and 7.5.1c, the medians but not the arithmetic means are the appropriate measures.

While in sampling from a normal population the arithmetic mean and the median are both consistent estimates of the true, underlying central tendency, there exist populations for which the arithmetic sample mean is not a consistent estimate of the sample parameter but the median is. These populations are characterized by the fact that extreme cases are likely to occur frequently in the samples (For instance, see Walker, H.M. and Levy, J., Statistical Inference, Holt Rienhardt and Winston, New York, page 414.) The fact that groups (of countries with the same advertising-ban-score) in Tables 7.5.1a and 7.5.1c contain extreme deviant quantities can be quickly verified. For instance in Table 7.5.1c the group of "Total ban on tobacco promotion for health reasons" consists of three small percent changes (-0.2, -0.4 and -0.8) and one large percent change of -5.1. But 5.1 is almost a seven-fold multiple of the nearest smaller value. Similarly in Table 7.5.1a the group "Enforced tobacco advertising ban" consists of three values for which -9.5 is approximately nine times that of the nearest lower value -1.1.

The statistic to use, then, for estimating the central tendency for groups of countries differing in their relation to the advertising ban is the median and not the arithmetic mean.

WHAT DID THE NEW ZEALAND HEALTH DEPARTMENT STUDY ON ADVERTISING AND DECREASE IN USE OF TOBACCO ACTUALLY FIND?

We recomputed the relevant sections of Tables of 7.5.1c and 7.5.1a, substituting the correct median for the inappropriate arithmetic means. (see Revised Table 7.5.1a and 7.5.1c). The Revised Table 7.5.1c gives the median rates of change in tobacco consumption per adult, according to tobacco advertising restriction, in 33 advanced economy countries and the Revised Table 7.5.1a gives the annual median rates of change in the percentage of adults smoking for the 20 advanced economy countries. Each revised table is limited to showing the country groups, average per cent change per country and the computed medians for each type of advertising ban group.

Results of these analyses are quite different from that based on the use of arithmetic means. The reason for that difference is clearly apparent. For instance, take the category of "Total ban on tobacco promotion for health reasons" in Table 7.5.1c. That group of countries experience an average decline in the amount of tobacco used which is quite modest with the exception of Portugal. While the large decline in tobacco use in Portugal may be real, it is certainly not typical for the group of countries that totally banned tobacco promotion for health reasons.

Revised Table 7.5.1a (page 69, Health and Tobacco)

Annual median rates of change in the percentage of adults smoking according to tobacco advertising restrictions in force, 20 advanced economy countries, 1970-1986.

Country and year of ban	Annual % Change per country	per group
Enforced tobacco advertising ban		
Iceland 1972	-9.5	group
Finland 1978	-0.1	median
Norway 1975	-1.1	-1.1
Portugal 1983	na	
Tobacco promotion in few media		
Belgium	-3.3	group
France	-1.6	median
Italy (enforced ban)	-3.6	-2.55
New Zealand	-1.4	
Singapore	-2.5	
Sweden	-2.6	
Tobacco promotion in most media		
Australia	-1.1	
Austria	-0.4	
Belgium	+0.6	
Canada	-1.8	group
Denmark	-1.7	median
FR Germany	-1.0	-1.75
France	-2.0	
Ireland	-2.1	
Netherlands	-2.2	
Switzerland	+0.9	
United Kingdom	-2.0	
United States	-1.7	
Tobacco promotion in all media		
Greece	na	
Japan	-1.2	-1.2
Spain	na	

Revised Table 7.5.1c (Page 70, Health and Tobacco)

Annual median rates of change in tobacco consumption per adult, according to tobacco advertising restrictions in force, 33 advanced economy countries, 1970-1986

Country and year ban enforced	Annual % change per country	per group
Total ban on tobacco promotion for health reasons		
Iceland 1972	-0.2	group
Finland 1978	-0.4	median
Norway 1975	-0.8	-0.6
Portugal 1983	-5.1	
Advertising never permitted for political reasons		
Albania	-0.9	
Bulgaria	-0.3	
Czechoslovakia	-1.8	group
East Germany	0.0	median
Hungary	-0.8	-0.3
Poland	+0.1	
Romania	+0.4	
Soviet Union	+0.3	
Yugoslavia	-0.9	
Tobacco promotion in few media		
Belgium	+0.5	
France	-0.02	group
Italy	-1.1	median
New Zealand	-1.6	-0.14
Singapore	-0.01	
Sweden	-0.1	
Tobacco promotion in most media		
Australia	-1.8	
Austria	+0.3	
Belgium	-0.8	
Canada	-1.2	
Denmark	+0.01	group
FRG, W Germany	-0.1	median
France	+2.1	-0.8
Italy	+2.2	
Ireland	-0.8	
Netherlands	-0.6	
Switzerland	-1.5	
United Kingdom	-2.0	
United States	-1.2	
Tobacco promotion in all media		
Greece	+3.5	
Japan	+1.1	group
Portugal	+3.3	median
Spain	+0.8	+1.1
Turkey	+0.1	

Once the bias introduced by the use of arithmetic averages has been removed, the emerging results are quite different than before. They may best be seen in Revised Figures K and L. Revised and Old Figure K and Revised and Old Figure L are shown on page 10, side by side to make the changes in results more visible. In the 33 advanced countries (Revised Figure K), the largest decrease in amount of tobacco used is in countries which permit advertising in most media. In the 20 countries with advanced economies (Revised Figure L) the greatest decrease in tobacco use is registered by countries that permit advertisement in a few media and in most media. In fact countries that permit advertising in all media have a somewhat greater decrease in prevalence of tobacco use than countries that have no advertising at all.

A comparison of the annual percent decrease in the amount and prevalence of tobacco use of countries that differ by advertising ban does not support the conclusion that banning advertising reduces tobacco use. These findings are in line with findings from the four major studies on partial and total bans (The Hamilton study, the BAA study, the WHO review, and the study of the IAA.) and so support their conclusions.

BIOGRAPHICAL NOTES

Dr. Sterling is Professor in the Faculty of Applied Sciences at Simon Fraser University in British Columbia. He has taught at Washington University at St. Louis, Princeton University, and the Medical Center at the University of Cincinnati.

Dr. Sterling is a fellow of the American Statistical Association, the American College of Epidemiology, and of the American Association for the Advancement of Science. He is also a fellow of the Canadian Committee of Scientists and Scholars.

Dr. Sterling has served as President of a number of scholarly associations including the Canadian Computer Science Society and the Biological Information Processing Society.
Dr. Sterling has published eight books and approximately 300 scientific articles.

Department of Scientific and Industrial Research

Applied Mathematics Division

27 July 1989

Mr Michael Thompson,
Tobacco Institute,
Private Bag,
AUCKLAND

Dear Mr Thompson,

I have been asked to comment on the analysis of Tables 7.5.1a and 7.5.1c in the report of the Toxic Substances Board on "Health or Tobacco – an end to tobacco advertising and promotion". My comments are attached. If the Tobacco Institute wishes to use them the DSIR requires that they be quoted in their entirety and that I be sent a copy of the material using them. This material would of course be kept confidential by the DSIR.

Yours faithfully,

Dr C.M. Triggs

Postal address Private Bag Auckland New Zealand Telephone (09) 893 660 Facsimile (09) 863 330 Telex 21623 MARC
Mt Albert Research Centre 120 Mt Albert Road Auckland

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Issue No. 29, July 1989

CONTROVERSIAL PROPOSAL TO BAN ALL FORMS OF TOBACCO ADVERTISING IMPINGES ON THE RIGHT TO 'THE FREEDOM OF COMMERCIAL SPEECH'.

Advertisers will already be aware of the Department of Health recommendation to ban all forms of tobacco advertising from December 1990. The ANZA Council, **in having absolutely no opinion whatsoever on the rights or wrongs of tobacco products**, believes that New Zealand advertisers could be seriously disadvantaged in the future by any government moves now to restrict the freedom of commercial speech.

The ANZA Council viewpoint is as follows:-

1.0 This debate is of major concern to Advertisers. It is a challenge to the whole question of freedom of expression and freedom of advertising in a free society.

2.0 ANZA strongly represents the right of any company, organisation or individual to be able to advertise a legal product or service.

3.0 The free flow of information about economic choices is essential to any democratic system based on consumer choice.

4.0 As a nation, freedom of commercial speech is critical to our freedom of choice and individual autonomy. Freedom in essence is the right to choose and this includes the right to make choices that others may disapprove of.

5.0 Tobacco is a legal product and is legally consumed. On this count alone we endorse that it must be legal for tobacco companies to retain the right to advertise.

6.0 A total ban on the advertising of any product or service would leave the manufacturer concerned with no incentive to develop new and improved products because they would not have the ability to communicate the availability of these products through advertising.

7.0 The banning of tobacco advertising, and therefore the banning of commercial speech, could easily become a weapon in the hands of every self-proclaimed reformer who seeks to advance social or economic change.

CASE FOR THE FREEDOM OF COMMERCIAL SPEECH

The case for 'the freedom of commercial speech' was delivered in a most forceful speech to the recent Congress of the World Federation of Advertisers in Washington DC.

The presentation was made by Professor Burt Neuborne of the New York University School of Law. Neuborne is the author of an extended essay "Free Speech, Free Markets, Free choice". He has a background of more than 25 years as a civil liberties lawyer in the United States.

The following is a summary of the main points Neuborne made:-

Commercial free speech is under attack due to the common notion that speech is divisible into first and second class speech, Neuborne says.

First class speech in Western nations consists of speech on religion, politics, science and aesthetics. In all democratic societies these forms of speech receive some institutional protection.

However, commercial speech is somehow seen as separate and second class. Neuborne sees the need to look at freedom of expression as a whole and **attempts to drive a wedge between commercial speech and other**

To the extent that governments regulate production and distribution methods, the assumption seems to exist that governments can equally regulate commercial speech as part of the process of the production chain.

Commercial speech is seen as being fundamentally different, as a form of speech which cannot enjoy the presumption in favour of free speech.

Political discrimination is one aspect.

Commercial speech is associated with the capitalist society. Intellectuals who do not share this world-view argue against freedom of commercial speech. Neuborne believes this is a form of disguised political censorship. The same intellectuals will vigorously defend political free speech and there is a need for their assumptions to be challenged by the commercial speech community.

Neuborne develops a four-part critique of the arguments for and against commercial freedom of speech.

1. THE VALUE CRITIQUE

The argument is made that there is something fundamentally different between a speaker in the commercial speech area and a speaker in the so-called first class areas of religion, politics, science and aesthetics.

Speakers in the first class area are attempting to express some deeply felt values, as protecting the capacity of the human spirit for higher spiritual things.

They argue that corporations have no souls, that they are not expressing their yearnings of the human spirit. All they are trying to do is make a profit.

This is only looking at the argument from the speakers' viewpoint, Neuborne says. The speech process does not stop with the speaker. In modern society there are usually three parts to the process. The speaker, the conduit which disseminates the speaker's message and, finally, the hearer, the ultimate recipient.

The hearer has an interest in receiving information in order to make decisions about the hearer's own life; decisions which reflect the same values and concerns underlying traditional free speech.

The hearer should be in a position to make decisions and choices free from the guiding hand of the state. Control by the state is an attempt to manipulate the hearer.

Commercial free speech is principally a hearer-related phenomenon. Neuborne says, a mechanism which permits the hearer to exercise choice and which permits systems based on choice to function in a morally and economically acceptable way.

2. THE PSYCHOLOGICAL CRITIQUE.

Commercial speech is seen as somehow different because it is more manipulative, a form of mass hypnosis. This argument is easily defeated on empirical and value grounds, Neuborne says.

In empirical terms, there is nothing more manipulative than political advertising but no one suggests regulating that because it is too manipulative or too effective.

The argument also undervalues the capacity of an individual to make judgements on what the individual wished to do. We would never think of censoring political speech aimed at individuals making decisions about the future of a nation.

We cannot say in one breath that the population is a paragon of democratic virtue, capable of making decisions on the future of society but the next day reduced to a group of gullible bumpkins who have to be protected against advertising because they are too stupid to know what's good for them, Neuborne says.

You cannot have a true political democracy if you allow the view that people are too stupid to make choices about what to believe or who to follow or will be influenced by a particular form of commercial speech.

3. THE ECONOMIC CRITIQUE.

The argument that advertising is economically inefficient has been demolished, Neuborne says. The purpose of modern advertising is to permit efficient choice mechanisms that could not be made in its absence. The efficiency of the market depends on the free flow of commercial information.

4. MATERIALIST CRITIQUE.

This argument says commercial speech should be controlled because it manipulates or has little value or that the hearer does not want to hear it.

The real reason, Neuborne says, is that it is seen as being too materialistic and over time it will erode society's higher values of caring and non-material concerns. An uncensored barrage of commercial speech will reduce us to a society that cares only for pleasure and the satisfaction of material wants.

This argument is easiest to defeat in a legal sense. It is simply a naked preference by the proponents of the argument and a clear restriction which can be dealt with in a legal manner.

However, commercial speech is essentially materialistic and the commercial community needs to be aware of its impact and to have concern for the general spiritual values of society. **It must regulate itself.**

With freedom of commercial speech comes the responsibility to use it wisely. Neuborne proposes three further arguements in favour of commercial free speech.

The first is the essential relationship between commercial free speech and what he terms democracy where consumers vote with their dollars. Such a system cannot work without a free flow of information.

If the state controls that flow then political and economic democracy is no longer viable. If the state controls what consumers see and hear then the state controls what consumers do. There is a twin commitment to economic and political democracy, Neuborne says.

Secondly, commercial speech is an important information source. Advertising is an expression of the collective wants and needs of society and, in addition, it funds virtually every other form of speech. All the traditional forms of free speech, political, religious, scientific and aesthetic, rely largely on advertising-supported media for free distribution.

Lastly there is the connection between commercial free speech and individual autonomy. There is the tendency on the part of reformers, Neuborne says, to want to make things a little better. They argue that a little bit of censorship just this once on just this one thing will make things better.

It will not be the last time they ask, Neuborne says.

Individual autonomy is the right to make mistakes, to do things that others may think are silly or wrong or foolish. Erode individual autonomy just once and you never put it back together again.

Commercial freedom of speech is worth protecting, Neuborne says.

Need for an independent and impartial hearing

The ANZA Council is now trying to convince Government that the issue of 'freedom of commercial speech' has to be debated quite separately from the proposed tobacco advertising ban.

At the moment it appears that the Department of Health is the final arbiter, acting as prosecutor, judge and jury, and the ANZA Council considers this to be totally undemocratic.

The ANZA Council has proposed to Government that the only fair and democratic procedure is for a totally independent commission or a parliamentary select committee to adjudicate on the many matters of principle that the advertising industry wishes to raise in defending the whole question of freedom of expression and freedom of advertising in a free society.

"Most of the large number of studies of cigarette company advertising have found little or no effect of changes in total advertising on total consumption. This result is consistent with that for the multi-industry studies reviewed above (emphasis added).

"For example, according to Hamilton's 1972 review of the literature from the period before the widespread dissemination of health risk information in 1953, early studies found little or no effect of advertising on total demand. Virtually all recent studies reach the same conclusions" (emphasis added).

A further quote from another literature survey covering the same subject produced by UK academics provides more evidence of the incomplete and slanted nature of the TSB's conclusions:

"The casual relationship between advertising and aggregate demand is still a matter of considerable controversy, but the latest careful research using sophisticated estimation procedures does tend to suggest that any casual effect is rather weak. Thus it seems to remain unproven that advertising had led to any marked increase in aggregate demand in general, or in the demand for either tobacco or alcohol products...It must be recognised that advertising could well be the wrong target in seeking to curtail consumption of products such as cigarettes and alcohol...It does appear that so far there is little convincing support for the argument that changes in total consumption of these products are caused by advertising" (emphasis added).

Further evidence omitted by TSB is given in the Appendix 3. It is clear, however, from these illustrations that the TSB conclusions from their modest literature review are diametrically opposed to conclusions reached recently by other independent, and perhaps more thorough appraisals.

4.5 Miscellaneous Errors, Methodological Faults and Other Mistakes in the TSB Report

The report is so full of errors, both large and small, that a full appraisal would take many weeks of work to fully analyse. The following list therefore contains only the more obvious errors found.

4.5.1 Inappropriate Comparisons

The TSB report frequently makes broad sweeping comparisons that might be appropriate in a really full analytical report but have no place in such a superficial analysis. For example, comparisons are made of countries which differ widely from each other in a whole range of national characteristics. Three of the four countries in the 'total ban on tobacco promotion for health reasons' convention used throughout the report are Scandinavian. All the countries in the 'advertising never permitted for

political reasons' category are East European. Four out of five countries in the 'tobacco promotion in all media' category are Mediterranean. It is obvious that there is no reason to assume that all things being equal the trends in these groups would have been the same.

In one comparison made of the growth of filter-tips market share, the inclusion of the (very different) East European countries totally alters the results of the analysis. The TSB report claims that "Advertising bans were,... , clearly associated with an increased rate of shift from plain to filter-tip cigarettes". This claim is made on the basis of Table 7.5.3 of the TSB report which gives the average increase in filter-tip's market share classified by one of five categories of advertising restriction.

It is doubtful whether even the simple examination the TSB have made of the table supports this conclusion, but in so far as it does, this is because of the large annual gain in filter's share of the market in the East European countries.

However there is one dominant and vitally important feature of the data which the TSB have ignored; the declining potential for filter market share gains as filter market share increases.

It is obvious that the higher the base of filter cigarette market share, the lower the potential left for further growth. Fifty percent growth in the market share is an achievable task when filter cigarettes account for a few percent of the market. It is clearly impossible for the filter share to grow by 50% when 97% of the market is already taken by such cigarettes.

It is very easily to make allowance (statistically) for this distortion. The methodology is shown in Appendix 4. Using this simple adjustment the following table provides the correct measure of how well each group of countries has performed in achieving filter cigarette market penetration.

Group	Performance Measure
Promoted in all media	5.74
Weak ban	4.81
Strong ban	4.36
Total ban - health	4.47
Total ban - political	2.78

The centre three groups are not statistically significantly different from each other, largely due to the small numbers of countries in some groups, but the 'Promoted in all media' and 'Total ban - political' are significantly different. This finding is consistent with advertising increasing the rate at which smokers switch to filter cigarettes and is totally at variance with the statement in the TSB report.

A further example of this kind if error is shown in Tables 7.5.1a and 7.5.1c.

The conclusion derived from Table 7.5.1a is that adult smoking has fallen faster in groups of countries with advertising bans.

The entire argument derived from table 7.5.1a hangs on data from three countries with a tobacco advertising ban: Iceland, Finland and Norway. The TSB have used an arithmetic average of the annual percentage fall in adult smoking to derive a 'group average fall' of 3.7%. **This figure is somewhat difficult to interpret from a public policy stance since it is derived from a 9.5% fall in Iceland. a 0.5% fall in Finland and a 1.1% fall in Norway.**

The large fall in smoking in Iceland (population just over 200,000) distorts the true position. In Norway and Finland (combined population over 9 million) the fall in smoking averages less than 1%. The population weighted average is also under 1%. This average fall of under 1% compares unfavourably with the much larger fall in smoking (on either a population weighted or unweighted basis) shown in the countries that allow tobacco advertising, as quoted in the TSB report. The true conclusion, to be drawn from this table is again the precise reverse of that drawn by the TSB.

Table 7.5.1c is similarly flawed. Again the TSB conclusion (that tobacco consumption per person has on average fallen faster in those countries where tobacco advertising is banned for health reasons than in countries where it is not), is dependent entirely on data from one country; in this case Portugal.

The TSB quotes an average fall in tobacco consumption of 1.6% for the four countries cited as having total tobacco promotion bans for health reasons. This is contrasted with a much smaller fall of 0.4% in countries where tobacco advertising is allowed. However, the 1.6% fall is derived largely from a large 5.1% fall attributed to Portugal between 1983 and 1986. In the other three of the four countries quoted as having a ban on advertising for health reasons (for a much longer period), the consumption fall averaged 0.46% (using the simple arithmetic average used by TSB). **The true and obvious conclusion therefore is that in three out of the four cases the advertising ban made no difference whatsoever. The entire TSB case in this paragraph rests on 4 years data from one small country, coupled with the highly questionable use of unweighted averages. In addition, as already noted adding one years data to the Portugal figures produces a remarkably different result.**

The abnormality of the Portugese data in 1986 is discussed in Section 5 of this document, which examines the TSB consumption analysis in considerable detail.

Yet another example of inappropriate comparison is shown in comparisons made from data relating to the percentage of adults who smoke. Leaving aside the lack of validity of these data (as already discussed) there are numerous problems in interpreting the data shown. For example, in relation to table 7.5.1a, the evidence in

this table of accelerated change in smoking prevalence attributable to the ban policies is very poor, and highly dependent upon one or two data points which are themselves suspect.

In the 'fully enforced ban' group, data has been used comparing the years 1978-86 for Finland, 1973-86 for Norway, but only for 1985-86 for Iceland (1 year) and in this one year a decline of 9.5% is noted. This in itself seem a highly suspect figure and there are no trend data to indicate how this drop fits in to previous patterns. Since Iceland introduced a total ban in 1972, 14 years before this one year chosen, it is unlikely that an immediate cause and effect relationship exists between the ban and this sudden apparent decrease in the percentage of adults smoking.

The data for Belgium is included in 'few media' group from 1980 and in the "most media" group for 1970-79. However, the figures quoted for the percentage of adults increased from 20.2% to 21.3% between 1970 and 1979 but from 41.5% to 32% from 1980-86. Clearly one, if not both of these sets of figures is inaccurate.

France, included in 'most media' and 'few media' for different periods, shows a greater decline in the 'most' period.

Italy is included under 'few media' for 1980-83, but the enforced ban placing Italy in this category did not come in until 1983.

There is only one country in the 'all media' group (Japan) for which data are available, and this is hardly sufficient for purposes of comparison.

If the suspect data for Iceland and Belgium are removed from the calculations, and the data for Italy placed in the correct category, the table is amended as follows:

	Group average (revised)	Report Average
Enforced ban	-0.6	-3.6
Few media	-2.0	-2.5
Most Media	-1.56	-1.2
All media	-1.2	-1.2

Once again the true conclusion to be drawn from the data is the precise reverse of the TSB conclusion.

4.5.2 Data Deficiences

The TSB report claims for itself great thoroughness. Yet there are numerous examples of omissions, errors and inconsistencies in even the basic data used. For example, the consumption measure is claimed to be reliable because:

"Consumption of all tobacco for smoking is measured," because "any kind of tobacco for smoking is a toxic substance from the point of view of this report, and total tobacco consumption for smoking, rather than just its manufactured cigarette component, has therefore been measured for each country, as data permitted."

Nevertheless, in the next two paragraphs it also claims that:

"cigarettes were counted by numbers", "as cigarettes are sold by number not weight...This eliminates the effect of lower tobacco content and cigarette weights in recent decades..."

As a result, it is not clear just how the consumption figures have been arrived at.

A further example of the deficiences of the data presented by the TSB report include the fact that the extent of an advertising ban has been calculated on a 10-point scale, and this has been described in some detail. However, the calculations for each country in the study are not shown, so it is impossible to verify.

The report also claims to "allow for supply factors" and "allow for distortions in recorded consumption" in various countries, but at no point explains how this has been done, or on what basis. Because of the issues which affect these two factors, it seems highly unlikely that sufficient evidence exists to undertake such an 'allowance', thus giving an air of quite spurious additional authenticity to this study.

Summary of Section 4

The many problems listed above are more than sufficient to invalidate the conclusions drawn by the authors. The TSB work is incomplete, and misleading in almost all respects.

Its central theme (that tobacco advertising has a pronounced impact on tobacco sales, and that therefore a ban on tobacco advertising would cut consumption), cannot be justified on the basis of the evidence and analysis presented in the report 'Health or Tobacco'.

Section 5: A Detailed Examination of the New Evidence Presented Concerning the Impact of Advertising Restrictions on Consumption.

5.1 The Background to the New Study Reported in 'Health or Tobacco'

The report contains details of a new study commissioned by the Tobacco Subcommittee of the TSB from the New Zealand Department of Health. The findings form the main substance of the case in favour of an advertising ban in New Zealand.

Little real information was provided about the depth of scrutiny undertaken in this 33 country analysis, and the choice of countries appears somewhat eclectic (OECD plus Singapore, but excluding for no particular reason, Hong Kong for which good data exists).

Much was claimed for the study and in Section 7.4 entitled 'Methodology of Department of Health's Study' it was stated that in an effort to avoid the deficiencies in previous studies this work broke new ground, inter alia allowing for price and income changes which the report regarded as being important influences, and using a more accurate consumption measure of total cigarette tobacco per adult.

These and other claims for this study have been discussed briefly in Section 4 of this document. After careful examination of the published report it must be concluded that there was no formal incorporation of the vital economic considerations in the analysis underpinning the results that were presented. The report relies on simply grouping countries by category of advertising restriction to arrive at its conclusions, and claims that this overcomes the problems caused by the varying economic conditions affecting cigarette consumption from country to country.

As the report states

'Grouping of countries by advertising restriction policy, and knowledge of the effects of incomes and tobacco prices on consumption, enable conclusions to be drawn about the effects of advertising policies. The overall conclusions of this study are robust and will not be upset by including or omitting one country.'

The analysis presented below will show there are reasons to believe both statements are incorrect, and that the conclusions of the TSB are at variance with the evidence on which they are claimed to be based.

5.2 A General Discussion of the Data and the Approach Adopted

The study attempts to establish the impact of advertising restrictions by examining the trends in cigarette consumption within 33 countries. The two key questions asked in the report are

'Are tobacco advertising bans accompanied by falls in consumption ?'

and

'Are tobacco bans worthwhile ?'

It is interesting that the first question talks about 'accompanied by' rather than causes, because the implication must be that there is a causative relationship if a ban is to be effective in reducing consumption and be 'worthwhile' in the language of the second question. This critique assumes that the report has actually attempted to establish a causal relationship.

In doing this the authors have firstly developed a measure of cigarette smoking which they claim to be 'reliable', and claims to allow for the various distortions in conventional measures. This is to be commended, unfortunately, it is not possible fully to understand how they have arrived at their measure, and as has been pointed out in Section 4.5.2 of this document, there are apparent contradictions in their claimed methodology for dealing with weight and numbers of cigarettes. Without an explanation of their calculations it is not possible to establish the authenticity of their approach to consumption.

Notwithstanding these reservations we have accepted their figures for the purpose of examining their conclusions, and this work is presented in Section 5.5 later. The one exception to this is Portugal, which because of its central importance to their conclusions we have examined in detail and concluded that there was an aberration in the end year used for the post-ban period (see Section 5.3 later).

The calculation of the change in the measure of consumption can also be criticised on the grounds that a simple arithmetic percentage change figure is used instead of a proper compound (multiplicative) measure ie. the % change over a period is calculated and this is then simply divided by the number of years in the period. This procedure is used for all data. It is likely to produce markedly inaccurate results if the rate of growth or decline in the data is over about 5% per year. Some bias will have been introduced by this but given the nature of their analysis this will probably not have had a material effect. Again in our analysis we have deliberately used the

same data as reported, even with our reservations, because of our desire not to introduce any differences to the basic data in our re-analysis of the findings.

The overall approach taken by the Department of Health was to examine trends in consumption only after the bans in Iceland, Finland and Norway, but both before and after in the case of the Portugal ban in 1983. These were compared with trends over the 1970-86 period for most other countries. The exceptions were France, Belgium and Italy, where periods before and after a change in advertising restrictions were used.

There are obvious criticisms in comparing different periods, particularly because in the case of cigarette smoking there have been negative trends in recent years associated with health publicity, and it could be argued that the best way to assess the change resulting from a ban is to examine time periods before and after as stated previously. It is not clear why this was not performed.

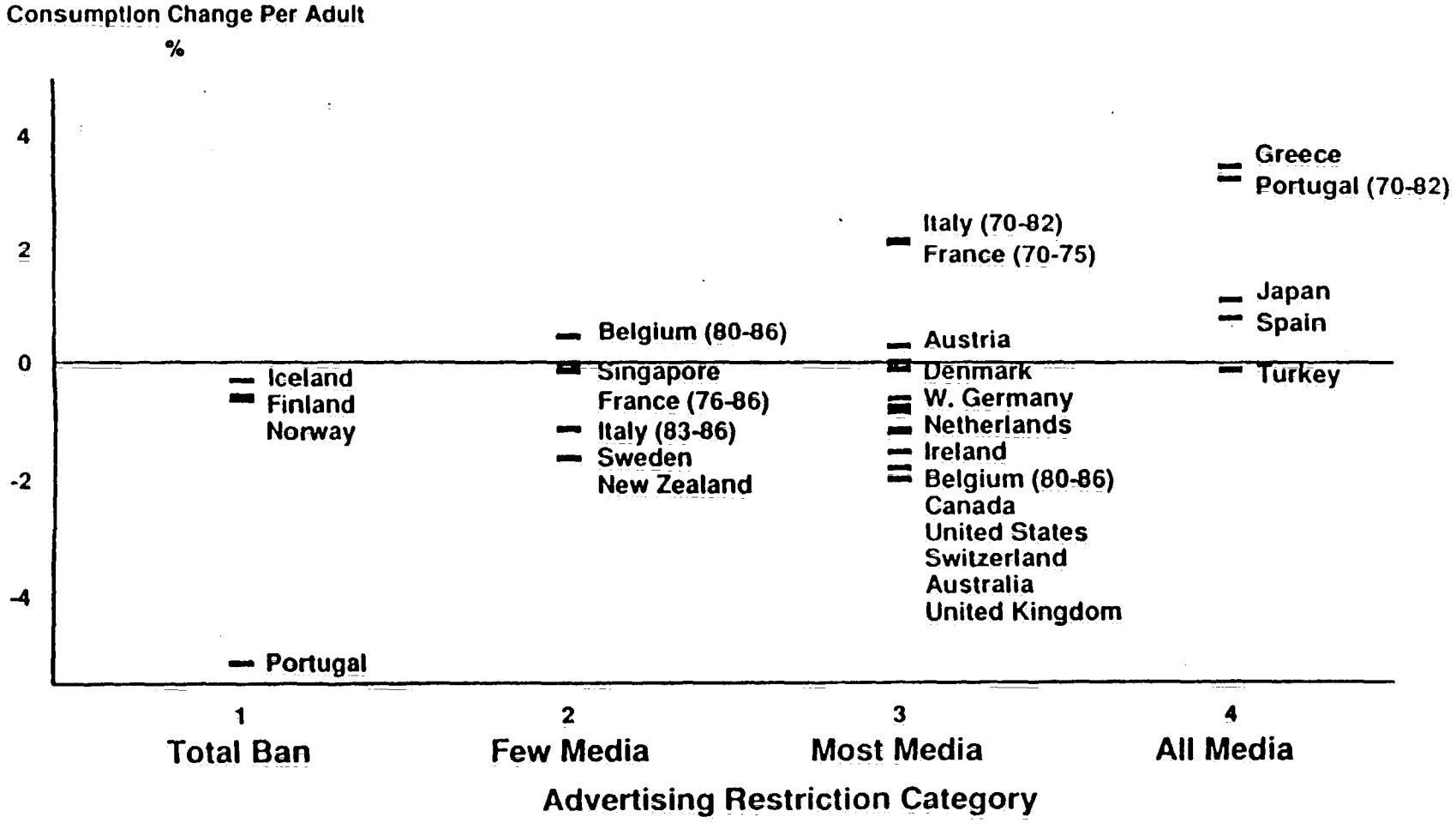
5.3 The Abnormality of the Consumption Data for Portugal in 1986

It has already been generally shown in Section 1.9.3 of this document that the TSB findings about the impact of adbans are, in fact, reliant on the data for one country, Portugal. Table 7.5.1c of the report groups the 33 countries by advertising restriction level, as defined by the TSB, and it is clear that the other three ban countries,Iceland, Finland and Norway, appear to have suffered unremarkable consumption falls similar to those experienced in many other countries.

This is shown in Fig 5.1 , where the data of Table 7.5.1c is presented graphically for ease of interpretation (the Eastern bloc countries are excluded as they are so economically and culturally different that little meaningful analysis can be conducted with their data). The exceptional nature of Portugal in the 1983-86 period, following the advertising ban introduced in 1983, is evident.

However, further scrutiny of the consumption data contained within the report (Appendix A Table A3.2) shows that this abnormality is caused by the very low figure for the final year alone, 1986. In 1987 consumption in Portugal rose again back to the level of 1985, according to the TSB data viz.

Fig. 5.1 INTERNATIONAL CIGARETTE TOBACCO CONSUMPTION
Annual Change % vs Ad. Restriction Category



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Portugal Consumption
(gm/adult/yr)

	1983	1985	1986	1987
	2068	1891	1750	1895
vs 1983			-15.4%	-8.4%

Source: Health or Tobacco

Therefore had the analysis for Portugal extended to 1987 the post-ban period would have seen an average annual decline of only 2.1%, compared to the 5.1% reported to 1986 in Table 7.5.1c.

This is dramatically different, and if incorporated into Table 7.5.1c would result in an average decline of -0.9% for the Total Ban Group compared to -1.6% previously. Statistically there would be no significant difference between the new consumption trend in this group and those of the other groups where restrictions apply, irrespective of the level of advertising restrictions.

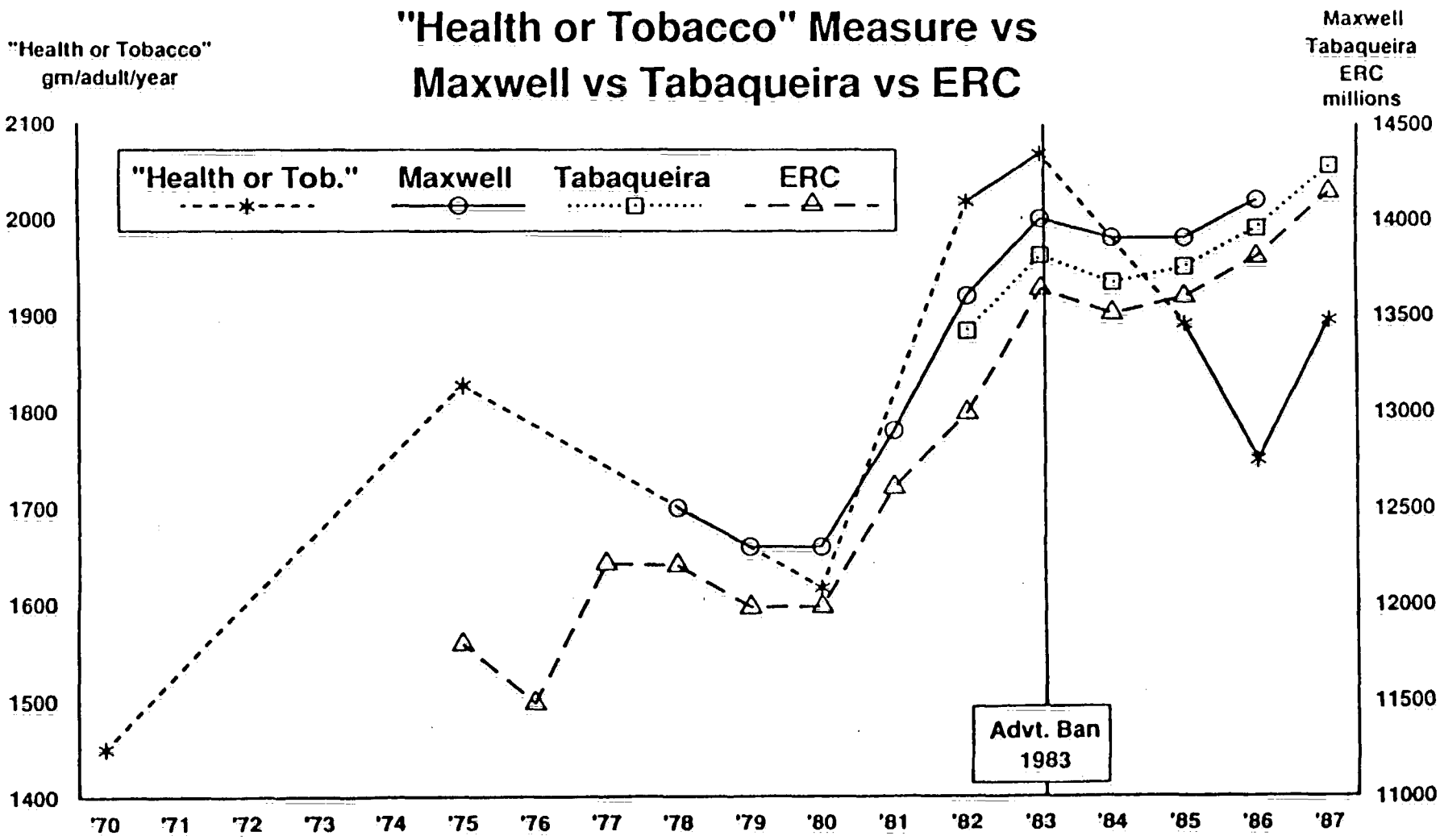
Further support for the view that the 1986 'Health or Tobacco' figure for Portugal is misleading is given by other estimates of cigarette consumption over the past few years. Three different sources are shown in Fig 5.2; the Maxwell market research estimates, the figures from Tabaqueira, the Portugese monopoly, and the ERC report data. From all these data there is no evidence of the temporary drop in 1986 shown by the 'Health or Tobacco' figures which are also also graphed.

An economic analysis of the pattern of consumption trends across countries (see below) confirmed the abnormal nature of the 1986 data for Portugal.

5.4 The Economic Factors and the Problem with the Income Data

As the report states both the price movements of cigarettes and the changes in consumer income are likely to be major factors in the consumption behaviour of smokers. In fact, the simple observation of consumption trends over time across different countries is inevitably limited in the extent to which it can give firm conclusions about the impact of advertising restrictions. Notwithstanding social and cultural differences, movements in the economic variables can easily mask or exacerbate any possible influence, as the TSB admit. In Table 7.5.1c, for instance, Belgium is reported as having an increase in consumption after advertising restrictions were tightened whereas it had fallen in the period when advertising was freer.

Fig. 5.2 CIGARETTE TOBACCO CONSUMPTION: PORTUGAL



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Their report includes a data bank, in Appendix 3, and this was used to investigate the degree of bias the non-inclusion of economic forces may have added to the Department of Health's study.

5.4.1 The Effect of Cigarette Price

We firstly show the relationship between the consumption changes and real price changes in the Appendix Table A3.1. This data was only given for the 'western' economy countries and the 28 cases are graphed in Fig. 5.3 (24 countries with Portugal, France, Belgium and Italy having two time periods). It was not possible to indicate the names of each country, but the important ban countries are identified, together with Greece.

The overall relationship is clear from this cross-sectional analysis, as one would expect from the many studies on the price elasticity of cigarette demand. The effect of real price increases is to give lower consumption. This will therefore have a significant bearing on the statistical consumption trends observed in the TSB report, and this is investigated later.

The one main exception to the clear downward relationship indicated by the 'line of best fit' is Greece. Portugal in the 83-86 period is again seen to be exceptional, as to an extent it is in the 70-82 period.

Evidence for Portugal being unusual in the 83-86 span has been given before, but it is clear that there is also a peculiarity with the Greek price/consumption relationship. It is believed that the reasons for this lie in the very low absolute price of cigarettes in that country until recently. It is understood that consumption is beginning to show signs of decline in the very latest data as some large price increases have been implemented. In any event Greece has been excluded from the detailed economic analysis presented later because of this behaviour.

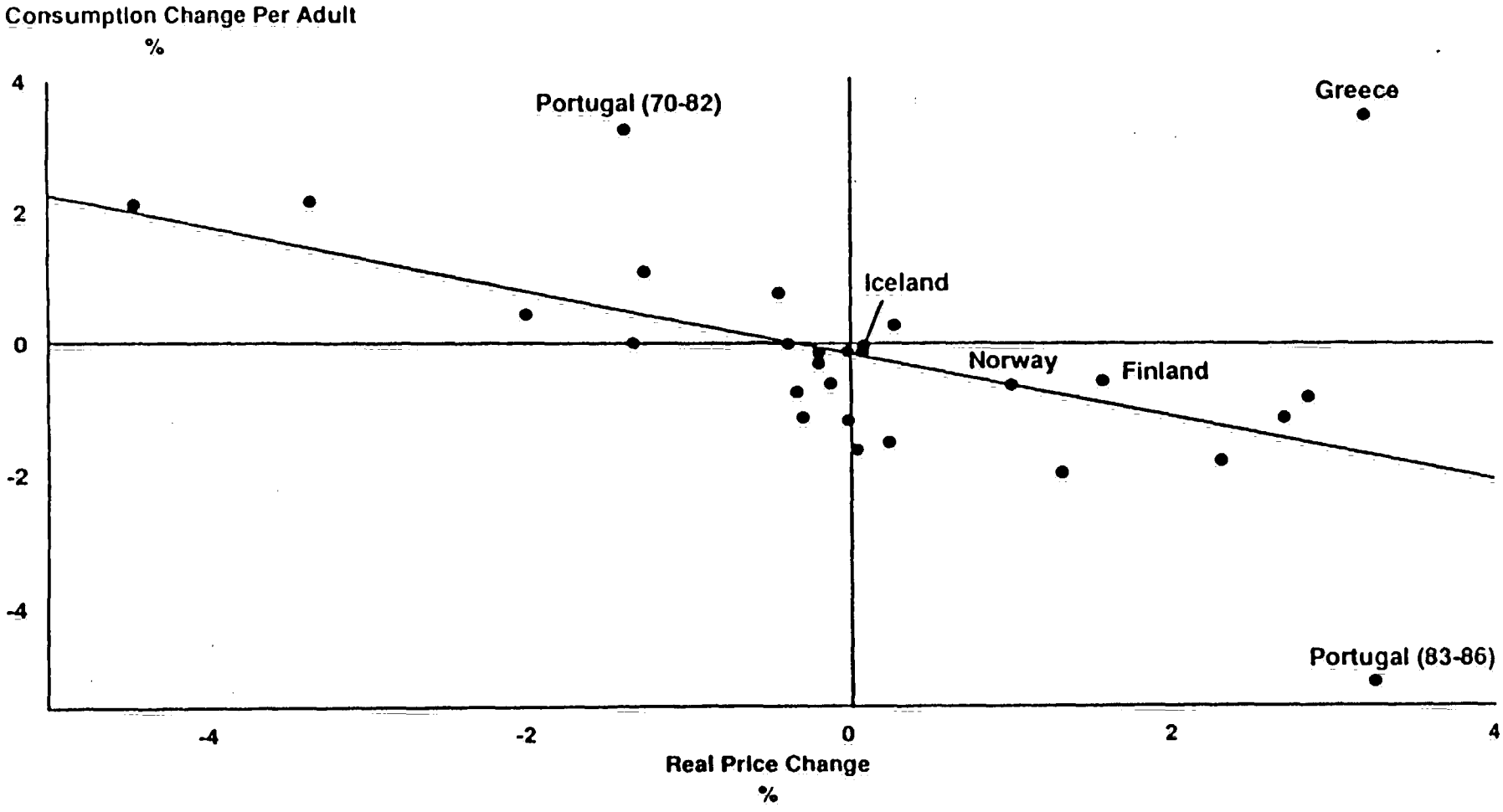
The other 22 western countries appear to behave much more rationally with regard to price and a significant relationship is evident.

5.4.2 The Effect of Income and the Use of Alternative Data

The other key economic determinant is consumer income, and the report gives data for real personal income per capita, although as the footnote states this is actually retail sales per capita in most cases. The use of retail sales as a proxy for income is likely to introduce appreciable distortion to any economic analysis and may be the reason the authors failed to report any income effects. It is well known in developed countries that retail sales are not a reliable guide to personal income/consumption, as with increasing real consumer wealth expenditure is likely to be directed more into services not measured by retail sales. This can be the only reason for the considerable declines reported in Austria (70-86) and Belgium (70-79). Other studies dealing with income effects and cigarette consumption have identified a significant

Fig. 5.3 INTERNATIONAL CIGARETTE TOBACCO CONSUMPTION

Annual Change % vs Real Price Change



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positive relationship between income growth and cigarettes consumed, and many of these papers are referred to in the TSB report.

The relationship between consumption change and the TSB income change is shown in Fig 5.4, exactly as for price previously. The lack of any clear positive relationship is evident. This prompted the use of alternative data for income, and the best source was considered to be the OECD Private Consumption per capita measure. This was transformed exactly as the previous TSB data. Not surprisingly considerable discrepancies are obvious , and Austria and Belgium now have positive growth in keeping with the European economic development of the past 15 years.

The relationship between consumption change and the OECD personal income change is shown in Fig. 5.5 , where a positive trend is much more clearly evident than with the TSB data.

5.4.3 The Affordability Concept for Cigarettes

The likely significant effects of price and income led to an examination of the affordability concept for cigarettes as a means of explaining consumption trends. This was used in the TSB report on a priori grounds without any specific justification from their own data , and basically is a simple combination of price and income. They expressed it in a form that is the inverse of affordability, but we use it here in a more conventional form. It is defined here as OECD real income divided by TSB real price and expressed in % change form exactly as before. This is graphed against consumption changes in Fig. 5.6. The stronger, more defined relationship than for either price or income (OECD) separately is clear.

Obviously the economic forces have played a major part in determining consumption changes in the countries studied, and their effects are systematic and measurable. Their omission from the analysis presented in the TSB report therefore seriously undermines the validity of the findings regarding the differential impact of advertising restrictions.

The affordability idea implies that a 1% real decrease in price has the same effect as a 1% increase in real income, and vice versa, and is clearly an oversimplification of the true responses which are likely to be different. This simple examination of price and income suggested that a more rigorous investigation of the simultaneous effects of these two economic factors would be beneficial, and this is now described.

Fig. 5.4 INTERNATIONAL CIGARETTE TOBACCO CONSUMPTION

Annual Change % vs TSB Real Income Growth

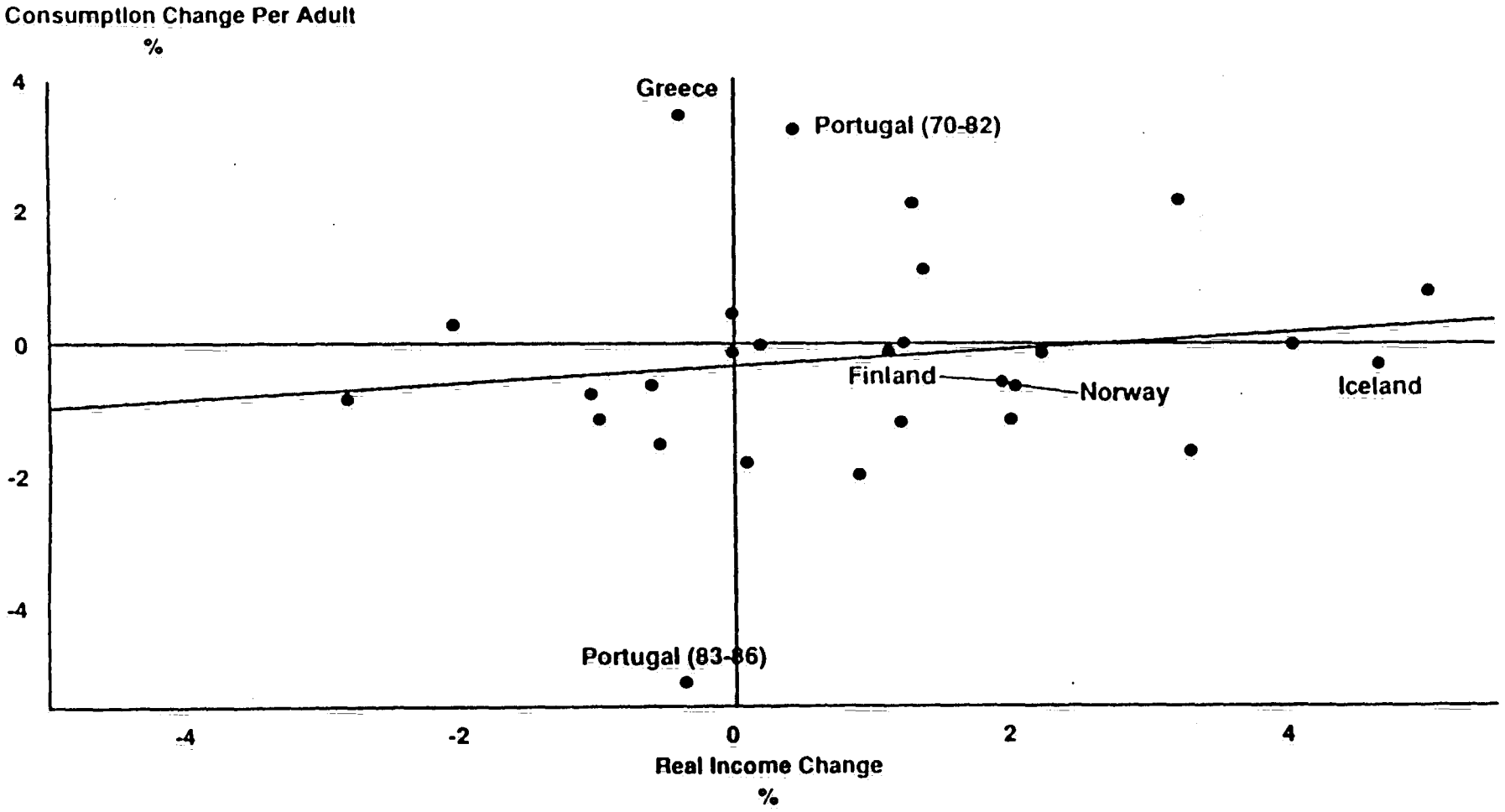

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Fig. 5.5 INTERNATIONAL CIGARETTE TOBACCO CONSUMPTION

Annual Change % vs Real Private Expenditure (OECD)

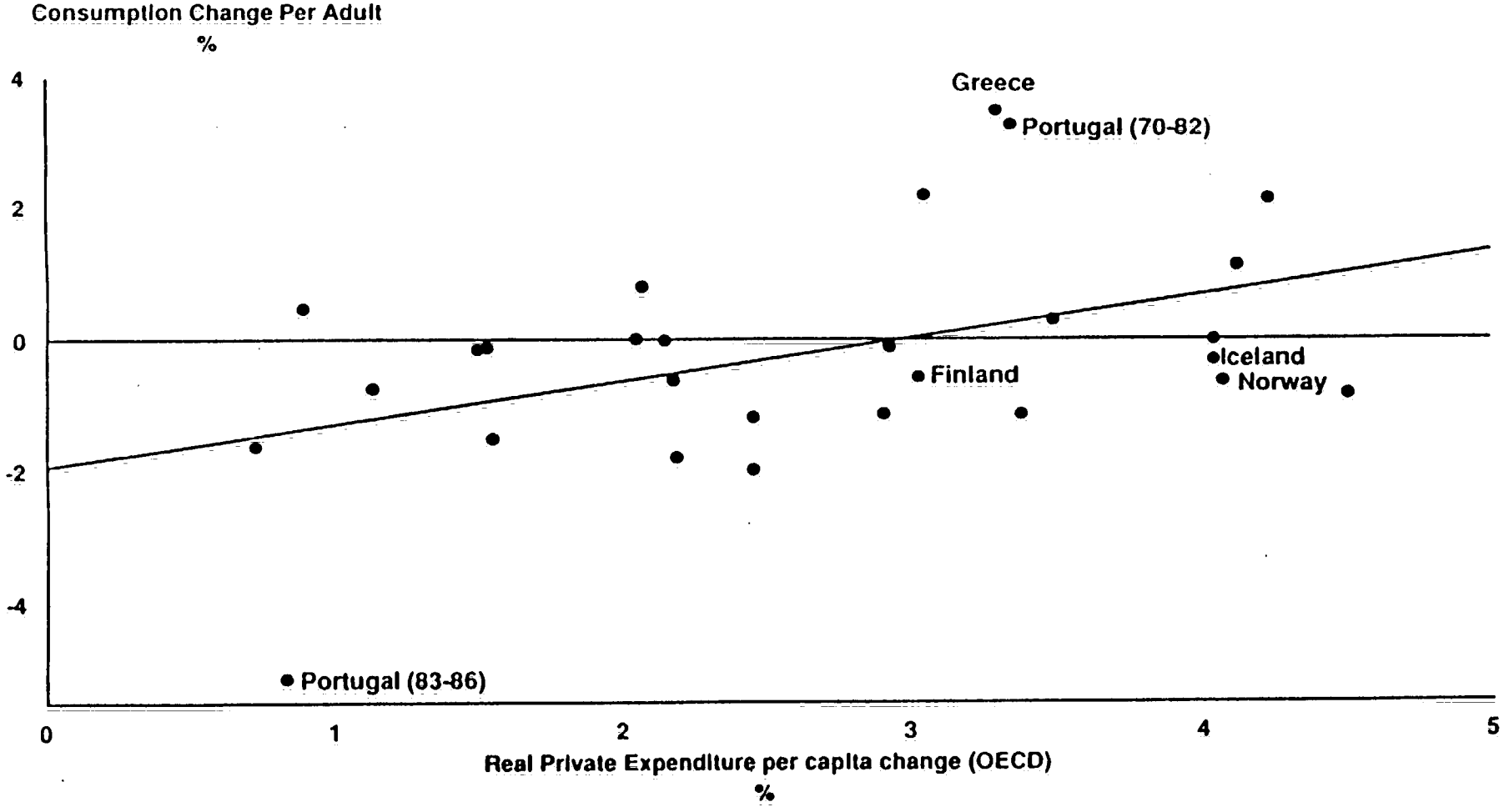

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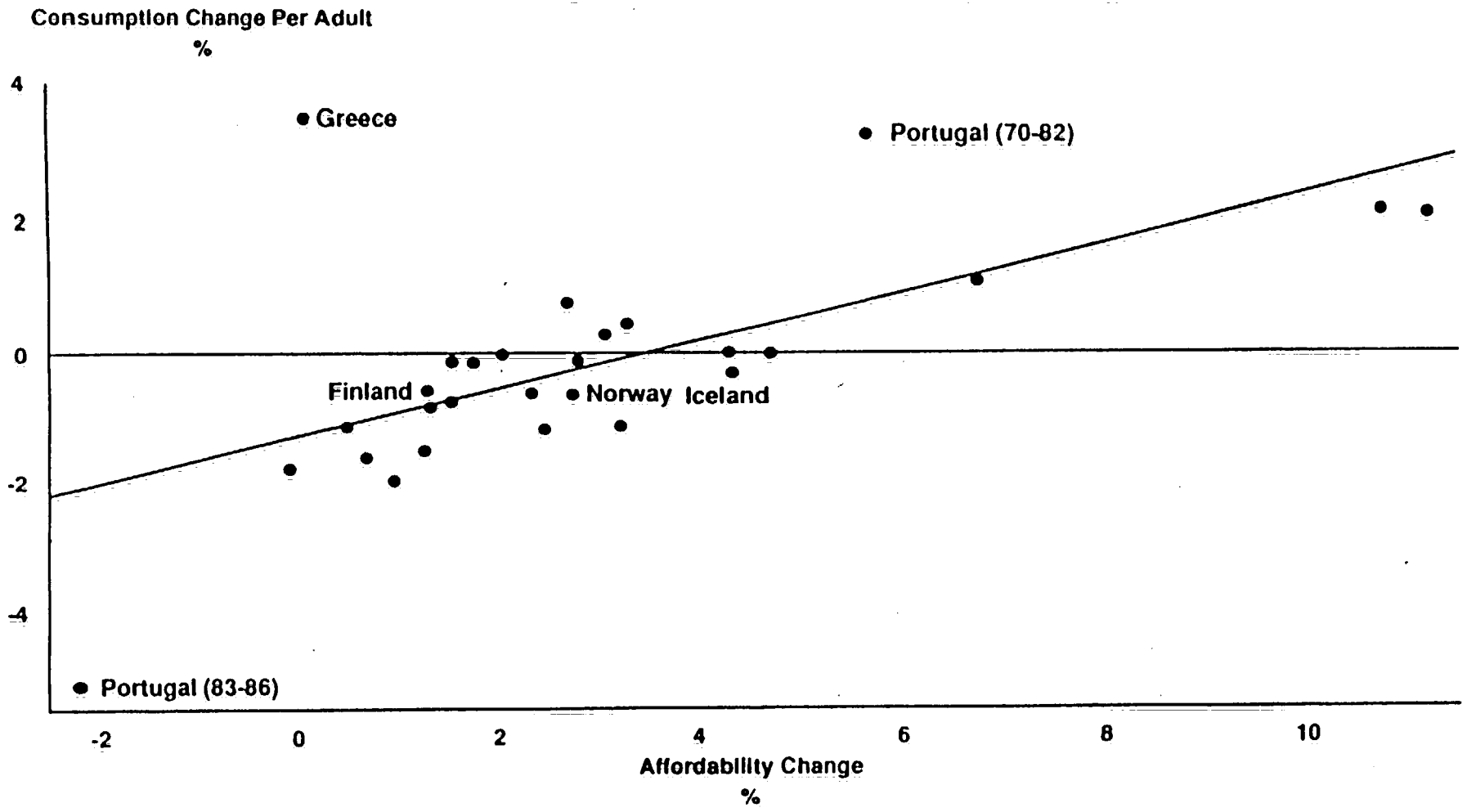
Fig. 5.6 **INTERNATIONAL CIGARETTE TOBACCO CONSUMPTION**

Annual Change % vs Affordability Change



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5.5 A Re-Analysis of the 'Health or Tobacco' Multi-Country Study

5.5.1 A Simple Economic Model of Cigarette Consumption

In this section a simple cross-sectional econometric model of consumption is developed to examine the extent to which the differential effects of price and income are able to explain the consumption changes in the context of the different levels of advertising restrictions. This allows us to examine directly in a rigorous statisical manner the possible impact of advertising restrictions.

For reasons indicated earlier Greece and Portugal are excluded from this analysis, which is based on the remaining 22 'western' countries.

We are seeking to explain the changes in consumption reported in the 'Health or Tobacco' study as a function of:

1) the real price change of cigarettes in the country (from the report)

2) the real income per capita change (OECD private consumption)

3) the advertising restriction classifications (from the report)

4) a possible constant (indicating an autonomous trend)

All change factors are calculated as in the TSB report and the model was linear in form in the spirit of the TSB work. The technical details of the model and the results are given in the Appendix.

5.5.2 The Modelling Results and the Implications of the Price and Income Findings

The results showed that the model was very satisfactory in terms of the statistical test criteria. The model demonstrated that the vast majority of the difference in country to country trends in consumption could be explained on pure economic grounds alone.

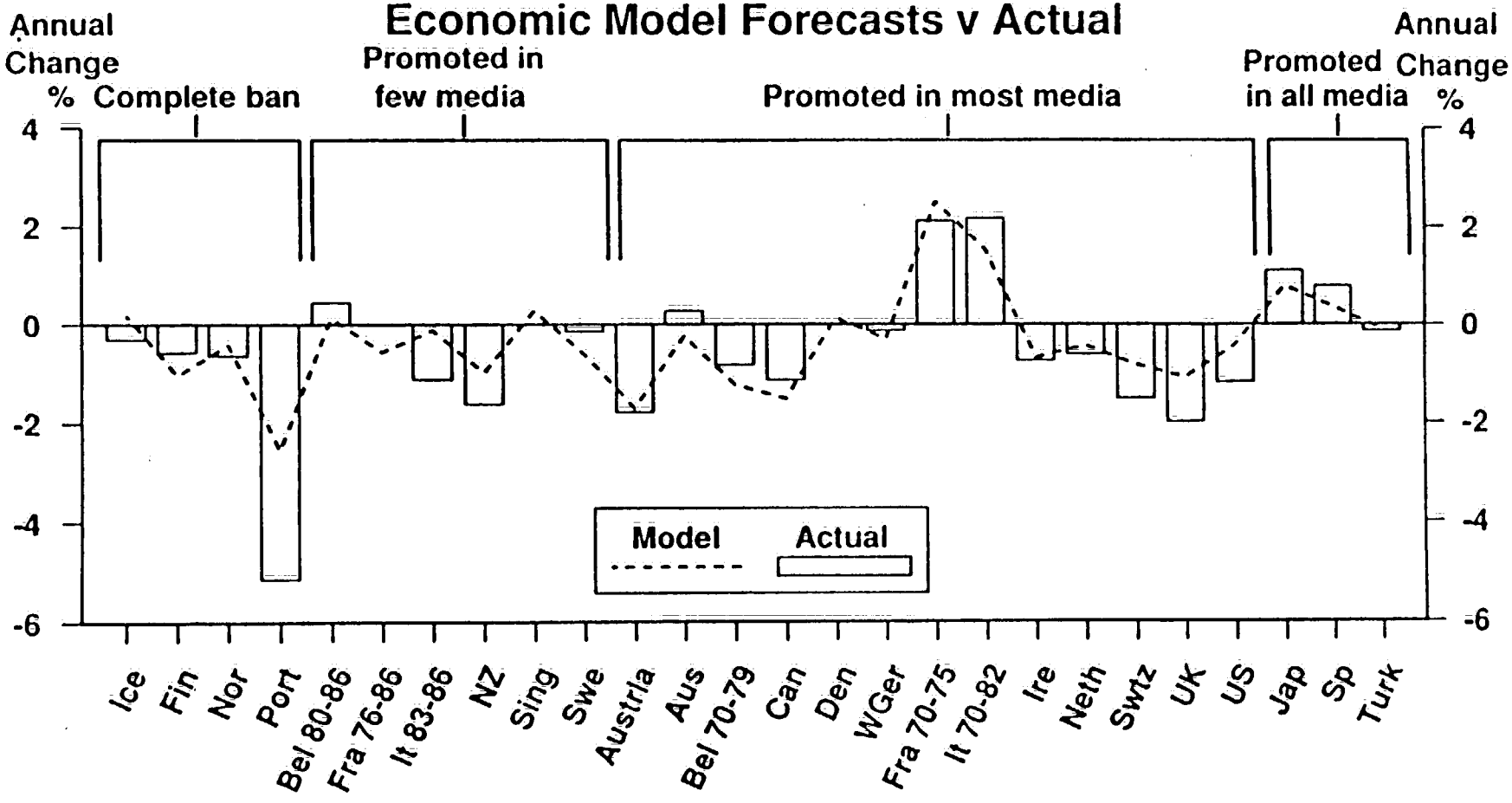
The extent to which this simple economic model was able to account for the inter-country variation is shown in Fig. 5.7. The bars represent the actual consumption change in the individual country and the broken line is the model estimate . As can be seen the actual and model are in broad agreement.

Real price was the most important determinant of cigarette consumption and income (as defined by OECD data) was also strongly significant. The estimated implied elasticities of demand are given in the table below:

Fig. 5.7

INTERNATIONAL CIGARETTE TOBACCO CONSUMPTION TRENDS

Economic Model Forecasts v Actual



Demand Elasticities

Price	Income
-0.52	+0.32

This means that a 1% increase in real price leads to a 0.52% drop in per capita consumption, and a 1% increase in income leads to a 0.32% increase in consumption. These figures are broadly within the range of previously reported results for various countries in other papers.

The different impact of price and income implies that the affordability concept, in which both have equal effect, is clearly too simplistic an idea. This is extensively used in the 'Health or Tobacco' report, but in the light of this work it is misleading. Price changes have a much larger effect than income changes.

In the economic model in addition to these price and income influences there was a negative trend in consumption over all the countries examined of 1.3% per year on average over the time periods of the analysis. This will relate to changing attitudes to smoking and health generally across the world.

5.5.3 The Examination of the Impact of Advertising Restrictions

The potential effect of different advertising restrictions was probed extensively, but it was not possible to establish any statistically significant impact on consumption of increasing control of tobacco advertising. No firm evidence was found for the differential impact of advertising restrictions.

After allowing for the identified price and income effects there was no statistically significant difference between consumption trends in countries with a total ban, those with heavy restrictions and those with few restrictions.

The direct implication for New Zealand is clear. It already has restrictions and was included in the TSB analysis in the 'tobacco promoted in few media' category. The evidence implies that any further restrictions would have no effect, based on this further analysis of the data in the Department of Health study.

In general terms, the conclusion is that the differences in the trends of cigarette consumption in different countries are related to economic factors, not to advertising restrictions, even when there is an advertising ban.

Unfortunately it was not possible to examine the relationship between the 'advertising control score' described in the report and consumption, because very little information on the individual country scores was provided. Only averages, as in Table 7.5.2, and some other scores are shown. The score itself is a very crude indication of restrictions and the lack of weighting of the components (see Append

4 in the report) is an obvious error. However it is still surprising that information was not provided as it is clearly considered important by the authors of the TSB report.

However, the strong indication from the results here is that there is likely to be no significant relationship between consumption trends and the score after due allowance is made for economic considerations.

5.5.4 A Further Look at Portugal : The Forecast for the 1983-87 Period

It can also be seen that Portugal in the 83-86 period is included in Fig 5.7, with in this case a model forecast based on the relevant economic data. The forecast appears to be much lower than the actual, but as has been discussed earlier this is due to the abnormally low 1986 actual reported in 'Health or Tobacco'.

Economic data for Portugal in 1987 has been obtained and a consumption forecast has been made for the 1983-87 period using the economic model. This is compared below with the actual from the data reported in 'Health or Tobacco'.

Portugal 1983-87

	Consumption Change
Forecast (economic model)	-2.2%
Actual ('Health or Tobacco')	-2.1%

The actual and model forecast are very close over the longer and more up-to-date 1983-87 period. Clearly the economic parameters determining consumption changes in different countries are able to predict a drop in consumption in Portugal over the 1983-87 period that is very much in line with what actually occurred. No measurable effect of the advertising ban is evident.

The data for Portugal in a longer period following the ban therefore shows no ban effect. This country in the 83-86 period was the single main observation in Table 7.5.1c to show that bans have an effect. The fact that one year later, even accepting the validity of the 1986 data, there is no ban effect that cannot be explained by a general economic model, is further strong evidence for bans being ineffective.

5.5.5 Conclusions on the Effectiveness of Advertising Bans in Controlling Consumption

The work reported here has rigorously re-examined the data presented in the 'Health or Tobacco' report. The finding is that there is no valid statistical evidence to support the view that increasing advertising restrictions have an effect on consumption.

In the data offered as evidence in the report it has been shown that the differences between countries with a complete ban, severe restrictions or few restrictions can be explained by general social and economic factors alone. The magnitude of the price and income influences are similar to those reported elsewhere by others. No advertising restriction factor is material in explaining these consumption differences.

The one country, Portugal, to show a strong apparent impact of a ban, has been shown to have no ban effect when the period of analysis is updated and extended for one year.

Using the economic factors established above across the 22 countries, together with the 1983-87 period for Portugal, we have re-analysed the key consumption finding in the report. Firstly we re-calculated the average consumption trend for the Total Ban category (health reasons) in Table 7.5.1c and presented in the Summary of the TSB report (Figure K) as hard evidence for advertising restrictions. Secondly, we produced a forecast for this group based on the economic model. This is shown below:

Consumption Trend by Advertising Restriction

	Report (Fig K) Portugal 83-86	Report with Portugal 83-87	Economic Model Forecast (Portugal to 87)
Full Ban (exc. E.Bloc)	-1.6%	-0.9%	-0.9%

By including one further year for Portugal, to give a four year period following the ban, the average annual decline in this group almost halves to 0.9% from 1.6%. Much more importantly, in the last column it is seen that this decline is entirely predictable given the general social and economic considerations.

Thus Fig. K and the findings given in the 'Health or Tobacco' report to support a ban are misleading. We can therefore conclude that no valid consumption evidence that an advertising ban would reduce sales in New Zealand is presented in the study.

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Appendix 1 The Role of Advertising in General

Advertising can be defined as the paid for communication of information. As such it is used for a variety of purposes ranging from publicising the availability of branded goods, generic campaigns ("drink more milk"), through to job recruitment, charity fund raising and a wide variety of other non-commercial purposes. Most advertising is bought in connection with selling branded goods and services.

Advertising does not have an automatic effect. Many advertisements do not produce the desired consumer response. Nor does the effectiveness of advertising necessarily increase in proportion to the amount spent.

These conclusions are massively documented in the advertising literature. For example, the proceedings of a recent (June 1988) Marketing Science Institute (US) conference included the following direct quote:

> "**How often does it work?** *The findings from split cable tests and analyses of scanner data suggest that individual advertising campaigns for established brands succeed roughly 20 to 30 percent of the time. The high percentage of unsuccessful advertising campaigns reflects the difficulty in obtaining a change in behaviour from inattentive, cynical customers, especially in the absence of specific, newsworthy message.*"

The message may be one the audience does not want to hear in which case it will be ignored. An advertisement for sports equipment is unlikely to work if placed in a magazine whose readership largely comprises old people. Even when an advertisement features a useful and appealing product and is correctly placed it may still fail to sell the goods as intended because, for example, it appears alongside an advertisement for a product known by users to offer superior value in terms of price or quality. Marketing text books illustrate the difficulty facing advertisers by pointing out that a great many new brands - most of which are heavily advertised - fail to become successful products.

Display advertising (i.e. all advertising other than classified) can be broadly divided into:

1. Brand preference advertising

2. Advertising having a purpose other than brand preference.

1.1 Brand Preference Advertising

Brand preference advertising seeks only small changes in consumer behaviour. The choice between one brand of toothpaste and another is of little consequence for the individual consumer although in aggregate it is obviously of great importance to the manufacturers involved in the market.

Even though the purchase decision in a market such as toothpaste is inconsequential it is nevertheless influenced by many factors. The price of the product in relation to competitive products, the quality of the product in relation to competitive products as judged from previous purchases, and special promotional offers, are just three obvious factors which can affect purchase decisions. In short, advertising expenditure is just one factor among many which may or may not influence the customer to choose one particular brand.

In established markets when one brand succeeds it usually does so at the expense of another brand. It is often the case that a successful new brand which breaks through into a market has some new competitive advantage over older brands. The advantage may be trivial (a new perfumed washing up liquid) or substantial (biological washing powder) but in either case advertising allows the consumer to hear rapidly of the new product and decide whether to make a trial purchase. Advertising speeds up the dissemination of information about new brands and therefore acts as a spur to competitive behaviour in consumer markets.

But crucially it is unlikely that all campaigns collectively can be successful. Brand advertising is primarily competitive in nature. In a new or rapidly expanding market it is conceivable, although unlikely, that all brands can be successful but the competitive nature of brand advertising means that in a stable or declining market, for every winner there **must** be a loser.

Managers and entrepreneurs advertise, despite the difficulties and uncertainties because they desire to succeed in the market place and gain the rewards that such success brings. Furthermore, executives are motivated to compete actively by fear of failure. In free and open markets product managers are obliged to continually remind consumers of the existence of their brand or face a fall in their market share - and hence in absolute sales. Falling sales figures will sooner or later result in a loss making enterprise, loss of reputation and eventually of jobs.

In a market having for example three soap or gasoline companies with equal technological and managerial skills, a company which ceases to advertise is likely to find its markets slipping away to its competitors. It is this which explains the prevalence of advertising in markets such as gasoline where it is obvious that overall consumption is not affected by brand advertising.

To summarise, the business of advertising and selling goods, even when the purchase decision is one of a most trivial kind, is neither simple nor easy. No matter how much

is spent on brand preference advertising there is no guarantee of success and a considerable risk of failure.

1.2 Advertising for Purposes other than Brand Preference

There is a major difference between advertising messages devoted to getting customers to retain their present brand or to switch brands - which individually play an insignificant role in the consumer's life, and attempting to use advertising messages to alter fundamental behaviour patterns. Advertising campaigns designed to persuade the public to consume more ("drink more milk") or less ("stop drinking or smoking") of a particular product or to otherwise change their behaviour ("save energy, wear seat belts") fall into this latter category.

It is evident that if the power of advertising is limited in relation to relatively trivial tasks such as getting the consumer to switch brands of toothpaste, there are grounds for believing that using advertising to obtain more fundamental changes in human behaviour patterns may be a much more difficult task.

There is, in fact, a large body of evidence which suggests that the more radical the change in human behaviour sought via advertising, the more difficult the task becomes. For example, there is evidence from the many attempts by Government bodies to change behaviour in relation to the drinking of alcoholic beverages. A survey of the effectiveness of over 150 alcohol education impact studies by a World Health Organisation expert concluded:

> *"Whilst increases in knowledge appear relatively easy to achieve, measurable changes in attitudes to alcohol or, more particularly, in actual drinking behaviour, are comparatively rare"."*

There is also evidence from the collective attempts of manufacturers to achieve sales of whole product categories. Such campaigns are quite rare but have been attempted, usually in connection with selling agricultural surpluses of products such as milk. There are great similarities between so called 'generic' campaigns and campaigns aimed at social engineering, such as 'health education' advertisements.

Attempting to modify consumer habits such as milk drinking is closer in content to getting people to smoke less or consume less energy than it is to a normal brand preference campaign. The evidence suggests that markets do not necessarily react to generic advertising - which is specifically aimed (unlike brand preference advertising) at increasing total market sales.

No fewer than 15 years of consistently high levels of generic advertising have totally failed to halt a continuing decline of milk sales. In the egg market consumption has similarly continued to fall notwithstanding heavy and prolonged generic advertising in an attempt to halt the decline.

The conclusion to be drawn from these and other well known examples is clear. Advertising is far from being the moulder of human tastes and desires it is sometimes thought to be. Particularly where the popularity of a product is in decline, it is at best doubtful that generic advertising is capable of reversing the trend.

To summarise, the role of advertising is a complex one. There are good reasons for believing that advertising does not provide an easy or automatic means of expanding sales at either the individual brand level or at the level of a whole industry. Sales of brands and industries are determined by many factors of which advertising is but one. There are reasons for believing that the task of radically changing human behaviour patterns is a more difficult task for advertising than is the far simpler, but still difficult, job of achieving brand switching behaviour.

II Brand Preference Advertising and Total Demand

It follows from the foregoing that advertising is most effective when its purpose is brand preference and is likely to be substantially less so when its purpose relates to more fundamental decisions as in the case of generic advertising.

What then is the likelihood that brand preference advertising will have the effect of increasing the overall market for a particular product?

The answer will depend on the nature of the market for the product.

If the product is new, as for example VCRs a few years ago, the effect of brand preference advertising may well be to expand the total market because the advertising, while directed to a particular brand, also ha the effect of making consumers aware of the product's existence or advantages.

There are product markets on the other hand ('mature' markets) in which the product itself and its advantages or disadvantages are virtually universally known. The cigarette market is one example. In such markets brand preference advertising does not make the existence or advantages of the product known because they are already known. The question dealt with in this section is whether brand preference advertising in such a market is likely to increase overall demand.

Such a result is highly unlikely. Reasons for saying this are based both on theoretical and empirical considerations.

There is a fundamental reason for supposing that the collective impact of individual brand campaigns is likely to be minimal. It is quite simply that in order to stand any chance of working the objectives and methods of campaigns aimed at stimulating entire markets are necessarily different from the objectives of ordinary brand campaigns.

Normal brand advertising neither attempts to stimulate sales of the product type as a whole, nor aims itself at people who are not in the market for the product. For example petrol advertising is aimed only at drivers, cosmetic advertising at women, and cigarette advertising at existing smokers.

The role of advertising within the marketing mix for an established branded consumer product is to stimulate **repeat** buying of brand 'X', and to help build up market share by increasing the number of regular, loyal buyers of brand 'X' at the expense of brands 'Y' and 'Z'. This is usually done by making the product itself more attractive and better value in some way than the competition, and then communicating this advantage by advertising.

Generic advertising is quite different from brand advertising in intention, even though it uses the same media and similar techniques. Generic advertising is intended to increase total demand for a product as a whole. This can be done either in terms of increasing the rate of consumption, halting a decline in consumption, or raising the price at which a given limited volume can be sold. In doing this it takes no account of the brands on sale with the market.

Effects of generic advertising can vary depending on the nature of the market and its objectives. It can stimulate demand either by:

a) Persuading non-buyers or users to try the product

b) Persuading existing buyers of all brands (as opposed to purchasers of the individual brand) to buy or use the product more frequently of in larger quantities

c) Increasing buyers' perception of the value of the product

It cannot do all three at once.

There are therefore very large and important differences between ordinary advertising campaigns aimed at selling individual products, and generic campaigns aimed at whole categories of product. There are therefore prima facie reasons for supposing that the collective impact of brand advertising is most unlikely to do the job of a generic campaign since the objectives are quite different.

In addition to these theoretical reasons for believing that brand advertising is unlikely to influence the size of entire markets, there are other reasons for believing such influences to be unlikely which can be supported by empirical evidence.

A campaign for a new soap stands a reasonable chance of getting a proportion of shoppers hands poised over the multiplicity of brands available in the supermarkets to try the new offering. If other factors such as price and quality offer real advantages

over other products the advertising campaign may even succeed in getting a few percent of shoppers to become loyal purchasers of the brand.

To suppose, however, that the collective impact of such campaigns will influence the shopper to wash more is somewhat absurd. It would suggest that heavily advertised product categories would automatically grow at the expense of less heavily advertised categories, that such effects would be easily visible when analysed, and that advertising expenditure in total is a fundamental force impacting heavily on economic growth as a whole.

In fact the evidence shows that little advertised product categories, such as fresh and largely unbranded fruits and vegetables, have not been vanquished over the years by their advertised brethren in cans. Careful mathematical analysis does not reveal a relationship between 'collective' brand advertising and product category sales. Finally there is no good evidence showing that advertising expenditure is a determinant of overall economic growth.

To the contrary many available studies indicate that even very large increases in brand preference advertising have no impact on aggregate or total demand for the products in question. One recent, quite remarkable illustration of this phenomenon was given in the October 1988 issue of the UK advertising research magazine 'Admap':

> *"As all right-minded people now agree, competition is a splendid thing, particularly for those who supply that major tool of competition which is advertising - for all that it may not always do much to expand the market for any particular product category. An interesting example of this last is the market for the national dailies and Sundays (newspapers), the total number of copies of which sold annually between 1980 and 1985 remained almost rock-solid at around 5.9 billion. During that time the money they spent between them in promoting their circulations on television rose fairly gently from (at 1987 prices) £15 million to £18 million. In 1986, however, they managed collectively to get through £40 million, and in 1987 they further sweetened the pot to £45 million. After all this, their total copy sales, which had been 5.8 billion in 1985, were 5.8 billion in 1986 and 5.8 billion in 1987, while the market shares of the individual titles barely moved. Nice for their agencies though, and for the hated television medium."*

A further recent illustration of very large variations in brand advertising obviously not affecting total demand comes from the UK alcohol market. Between 1978 and 1987 brand advertising for beer rose in real terms by over 80%. In that period beer consumption fell by 14%. This represents a rise in advertising spending (adspend) per litre of over 100% - resulting in a major sales fall. Similarly, in the UK spirit market between 1978 and 1987, adspend rose by over 70% yet sales fell 4%. By contrast in the wine market, adspend per litre fell by 26%, yet sales soared 65%. These data are illustrated in Chart II.2.

The message is clear. Brand expenditure in aggregate is most unlikely to have an automatic impact on consumption trends. This is not to say however that all individual campaigns within those aggregate figures must have been failures.

For example, the Fosters Lager campaign in the UK is widely credited with having very substantially increased the Fosters Lager market share and absolute sales level very substantially over the last decade in Britain. However, given the overall beer sales decline, illustrated above, it goes without saying that the success of Fosters has been at the expense of other less successful brands. The Fosters advertising campaign accounted for only 5% of beer advertising in the UK in 1987.

In this context the cigarette market in the UK also provides a very good example of the lack of influence brand advertising has in aggregate over total sales. Advertising expenditure has risen by 7.5% in real terms since 1975. In this period sales of tobacco products have fallen by approximately 27%.

Here again brand preference advertising is shown to be ineffective in stimulating aggregate demand. It is not surprising that this should be so given that brand preference advertising is not designed to do this job.

A large number of studies in these areas have been completed by Government departments, academics and others to test for the effect of advertising on total consumption and on inter-industry demand. The conclusions derived from these studies provide substantial supporting evidence for the arguments put forward above and are shown in Appendix 4.

Appendix 2 Per Capita Tobacco Consumption Trends in OECD Countries With and Without a Tobacco Advertising Ban.

		1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	% Change from 1975
8	Netherlands	1748	1635	1940	1683	1908	1586	1501	1476	1372	1146	1074	1048	1031	41 05
11	Ireland				2331	2257	2211	2119	1952	1865	1806	1759	1663	1589	31 84
4	UK	2600	2500	2400	2600	2500	2500	2100	2100	2100	2100	2000	2000	1900	26 92
22	Canada	2563	2605	2641	2616	2666	2679	2729	2692	2531	2456	2330	2189	2043	20 28
27	New Zealand	2018	2000	2028	2003	1954	1906	1954	1920	1887	1835	1724	1593	1620	19 72
9	Iceland	1402	1399	1268	1258	1275	1256	1288	1261	1274	1269	1192	1146	1132	19 23 u
6	USA	2811	2814	2002	2767	2762	2773	2781	2727	2555	2533	2482	2416	2353	16 30
25	Belgium Lux	2031	1987	1949	1761	1892	1913	1935	2134	2080	2041	1918	1852	1745	14 12
21	Australia	2301	2213	2200	2290	2352	2382	2310	2135	2089	2112	2199	2129	2024	12 05
23	Finland	1714	1351	1389	1391	1456	1476	1378	1430	1466	1537	1387	1465	1555	9 28 u
28	Norway	2050	1995	2012	1995	2044	1980	1942	1834	1836	1841	1889	1876		7 85 u
5	Norway	1581	1519	1573	1487	1566	1629	1553	1413	1434	1451	1515	1534	1504	4 90 u
20	Denmark	1707	1779	1766	1750	1633	1590	1567	1714	1646	1745	1741	1701	1647	3 52
18	Germany FR	1997	2080	1863	1979	2028	2084	2092	1815	1930	1951	1973	1924	1930	3 34
29	France	1609	1582	1626	1591	1640	1628	1608	1615	1635	1660	1746	1798	1693	5 24
13	Turkey	1294	1344	1372	1176	1102	1144	1434	1330	1284	1296	1276	1280	1375	6 26
12	Portugal	1350	1285	1350	1340	1304	1291	1347	1378	1435	1410	1409	1420	1449	7 39
26	Italy	3202	3222	3240	3165	3440	3499	3573	4110	3596	3660	3687	3660	3459	8 05 u
19	Austria	1844	1905	1943	2000	2076	2055	2078	2053	2102	2059	2070	2064	2011	9 06
15	Spain	1669	1783	1861	1742	1914	1899	1734	1822	1875	1944	2064	2020	2067	23 83
14	Grence	2373	2486	2556	2645	2609	2309	2413	2624	2702	2847	2911	3009	2959	24 72
17	Norway	438	427	484	456	501	546	487	425	428	471	555	630	655	49 52 u

Sources

4 UK Smoking Statistics, N Wald and S Kirkluk Dpt of Environmental and Preventive Medicine, St Barthlomew's Hospital Medical College, London, S Darby, Sir Richard Doll and M Pike, Imperial Cancer Research Fund Cancer Epidemology and Clinical Trials Unit Oxford, R Peto, Imperial Cancer Research Fund Cancer Studies Unit Oxford

5 Norwegian Customs and Excise, Consumption of Manufactured Cigarettes and RYO in Grammes per Capita

6 US Dept of Agriculture Year Book, Consumption in Sticks per Capita

8 Centraal Bureau voor de Statistiek Cigarette Consumption per Capita

9 Jonas Ragnarsson, Icelandic Cancer Society, Reykjavik, June 30th 1988, Units total cigarette Consumption per Capita

11 Revenue Comissionaires annual Report Cigarette Consumption per Capita

12 Tabaqueira Cigarette Consumption per Capita

13 TEKEL, Cigarette Consumption per Capita

14 Series Historicas do Consumo de Tabaco Elaborado (1957 88), Cigarette Consumption per Capita

15 Greek Ministry of Finance, Cigarette Consumption per Capita

16 Singapore Department of Statistics, Ministry of Trade and Finance, Cigarette Consumption per Capita

17 Norway Customs and Excise, Sales per Capita

18 Statistiche Bundestamt Wiesbaden, Finanzen und Steun, Reihe 9 1 2 Tabakgewerbe, 1987, Cigarette Consumption per Capita

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19 Austria Tabak, Cigarette Consumption per Capita
20 Tobaksindustrein, Cigarette Consumption per Capita
21 Australian Tobacco Board Annual Report, Cigarette Consumption per Capita
22 Canadian Tabacco Manufacturers' Council, Cigarette Consumption per Capita
23 Finnish Tobacco Manufacturers' Association, Cigarette Consumption per Capita
24 Tobacco Institute of Hong Kong Ltd, Estimate Cigarette Consumption per Capita
25 Belgische en Luxemburges fiskale bandjes, aangekocht voor in België en in Luxembourg Units Cigarette consumption per Capita
26 Officio Studi Federazione Italiana Tabaccai, Units Cigarette Consumption per Capita
27 New Zealand Customs Department, Consumption of Cigarettes per Capita
28 Norwegian Customs & Excise Directorate, per Capita Consumption in Grammes per Capita Over 15
29 SEITA Cigarette Consumption Units per Capita

Note
1 Countries Ranked by % Changed since 1975
2 Where incomplete data exists % change figures relate to available period
3 All Data in the last column is derived from the data shown in the table
4 All population data is from OECD Historical Statistics 1960 1987
5 Were Consumption Data was given in Units of Mass, the conversion 1 cigarette = 1 gramme was used to obtain Consumption in pieces
6 WHO Data is Defined as Consumption of manufactured Cigarettes per adult
as the population base is different from the OECD source diffrences can be expected
7 α Country with a ban on tobacco advertising

Appendix 2 (Continued) Per Capita Tobacco Consumption Trends in OECD Countries With and Without a Tobacco Advertising Ban.

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	% Change from 1975
Netherlands	3060	2770	3060	2430	3010	2730	2050	2020	2160	1560	1690			44 77
UK	3210	2970	2950	3020	2840	2750	2470	2270	2180	2180	2120			33 96
Ireland	3490	3240	3110	2940	2910	2890	2750	2870	2870	2630	2560			26 65
Belgium Lux		2380	2260	1990	2130	2230	2080	2390	2140	1910	1990			16 39
Sweden	1860	2030	1770	1790	1920	1950	1770	1790	1780	1790	1660			10 75
Germany FR	2660	2650	2330	2500	2530	2610	2540	2200	2280	2350	2380			10 53
Finland	1880	1540	1640		1890	1840	1870	1780	1820	1910	1720			8 51 α
Norway	760	730	770	730	810	850	700	700	540	580	710			6 58 α
Portugal	1800	1660	1750	1760	1840	1780	1800	1800	1870	1730	1730			3 89
Switzerland		3050	3300	3170	3620	3680	2710	3190	3120	2880	2960			2 95
Denmark	7100	7500	7400	7300	7400	7200	7100	7800	7300	7700	7800	7500	7200	1 41
Iceland	3020	2820	2850	3130	3220	3240	3240	3200	3160	3130	3100			2 65 α
Austria	2350	2500	2600	2670	2700	2670	2550	2680	2650	2510	2560			8 94
France	2170	2150	2060	2130	2170	2080	2050	2050	2070	2090	2400			10 60
Italy	2120	2180	2170	2090	2250	2320	2180	2390	2410	2370	2460			16 04 α
Greece	3130	3250	3350	3480	3470	3420	3590	3370	3340	3500	3640			16 29
Spain	2110	1600	1900	1800	2030	2320	2360	2460	2260	2620	2740			29 86

Sources 1 World Health Organisation Estimates (Consumption of Manufactured Cigarettes per Adult)

Note
1 Countries Ranked by % Changed since 1975
2 Where incomplete data exists % change figures relate to available period
3 All Data in the last column ie derived from the data shown in the table
4 All population data is from OECD Historical Statistics 1960-1987
5 Were Consumption Data was given in Units of Mass, the conversion 1 cigarette = 1 gramme was used to obtain Consumption in pieces
6 WHO Data is Defined as Consumption of manufactured Cigarettes per adult,
as the poulation base is different from the OECD source diffrences can be expected
7. α Country with a ban on tobacco advertising

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Appendix 2 (Continued) Per Capita Tobacco Consumption Trends in OECD Countries With and Without a Tobacco Advertising Ban.

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	% Change from 1975
Netherlands	1749	1634	1941	1693	1895	1555	1495	1488	1531	1186	1083			38 05
Ireland	2366	2319	2218	2293	2286	2205	2091	1925	1854	1785		1638	1581	31 06
Belgium/Lux	2501	2448	2504	2423	2588	2595	2633		2143	2015	1897	1818	1768	29 33
UK	2359	2324	2241	2229	2211	2158	1956	1811	1802	1761	1743	1682	1669	29 26
Canada	2512	2636	2653	2660	2688	2680	2729	2695	2532	2468	2339	2183	2051	18 38
Finland	1719	1354	1393	1389	1448	1485	1375	1429	1462	1536	1387	1464	1561	9 18 α
Sweden	1428	1459	1382	1414	1411	1432	1382	1453	1393	1379	1341	1338	1322	7 47
Iceland							1926	1778	1844	1863	1805	1770	1800	6 56 α
Germany FR	2004	2080	1888	1984	2014	2063	2104	1760	1851	1924	1952	1922	1923	4 03
Switzerland	2420	2416	2517	2432	2362			2474	2515	2490	2418	2404	2402	0 75
Denmark	1403	1478	1454	1430	1446	1405	1386	1524	1427	1506	1525	1465	1404	0 02
Portugal				1373	1339	1324	1378	1442	1473	1451	1441	1451		5 71
Italy	1600	1610	1620	1582	1720	1750	1786	1794	1799	1830	1843	1774	1727	7 93 α
France	1558	1535	1577	1546	1640	1568	1576	1586	1606	1632	1717	1686	1692	8 58
Austria	1847	1903	1942	1997	2080	2053	2075	2047	2052	2065	2064	2062	2007	8 63
Spain	1643	1761	1837	1725	1896	1884	1701	1810	1864	1935	2052	2015		22 64
Greece	2089	2182	2245	2322	2294	2271	2415	2625	2701	2848	2909	3010	2961	41 70
Norway		422	495	468	491	538	488	437	436	459	554	624	645	52 83 α

Sources 2 Maxwell Research Estimates (Cigarette Consumption per Capita)

Note
1. Countries Ranked by % Changed since 1975
2 Where incomplete data exists % change figures relate to available period
3 All Data in the last column ie derived from the data shown in the table
4 All population data is from OECD Historical Statistics 1960 1987
5 Were Consumption Data was given in Units of Mass, the conversion 1 cigarette = 1 gramme was used to obtain Consumption in pieces
6 WHO Data is Defined as Consumption of manufactured Cigarettes per adult.
as the poulation base is different from the OECD source diffrences can be expected
7. α Country with a ban on tobacco advertising

Appendix 2 (Continued) Per Capita Tobacco Consumption Trends in OECD Countries With and Without a Tobacco Advertising Ban.

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	% Change from 1975
UK	3286	3191	3009	2906	2862	2716	2411	2170	2064	2028	1950	1885	1827	44 42
Netherlands	1748	1635	1940	1683	1908	1624	1487	1546	1358	1160	1074	1092	1041	40 45
Belgium.Lux	2031	1987	1950	1761	1892	1913	1935	2088	1723	1538	1611	1386	1280	36 99
Canada	2586	2686	2708	2661	2727	2680	2729	2743	2578	2462	2343	2178	2072	19 85
USA				2759	2727	2725	2773	2641	2545	2523	2486	2413	2366	14 27
Australia	2315	2127	2286	2298	2274	2394	2357	2279	2214	2208	2065	1976	2066	10 76
Finland	1719		1388	1391	1360	1356	1384	1717	1466	1536	1469	1468	1559	9 32 «
Japan	2633	2435	2669	1749	2684	2661	2604	2640	2606	2594	2560	2541	2415	8 25
Germany FR	2041	2098	1891	2011	2054	2085	2112	1855	1917	2005	2021	1994	2028	0 65
Sweden	1425	1458	1376	1417	1441	1431	1380	1449	1447	1462	1356	1418	1430	0 38
Switzerland	2419	2419	2518	2431	2368	2409	2440	2473	2548	2520	2521	2414	2499	3 32
Italy	1601	1611	1620	1583	1720	1749	1787	1879	1908	1861	1978	1839	1716	7 18 «
Ireland		1642	1620	1647	1996	2205	2105	1925	2012	1852	1808	1771		7 84
Austria	1845	1905	1943	2000	2076	2055	2078	2053	2142	2046	2141	2048	1995	8 15
France	1560	1536	1579	1545	1599	1590	1582	1585	1636	1659	1744	1708	1694	8 58
Portugal	1380	1316	1376	1467	1348	1339	1381	1412	1492	1434	1431	1406	1531	10 95
Spain	1751	1920	1994	1884	2024	2046	1907	1844	1692	1973	2023	1987	2081	18 83
Denmark	1324	1400		1450	1427	1374	1386	1524	1646	1730	1725	1668	1628	22 96
Greece	2380	2485	2255	2660	2636	2641	2724	2623	2621	2766	2826	2900	2952	24 01
Norway								425	426		567	627		47 59 «

Sources: 10 Tobacco Merchants of the US inc Special Reports Nos SR88-2, SR87-2, SR 84-3 Cigarette Consumption per Capita

Note:
1 Countries Ranked by % Changed since 1975
2 Where incomplete data exists % change figures relate to available period
3 All Data in the last column ie derived from the data shown in the table
4. All population data is from OECD Historical Statistics 1960-1987
5. Were Consumption Data was given in Units of Mass, the conversion 1 cigarette = 1 gramme was used to obtain Consumption in pieces
6 WHO Data is Defined as Consumption of manufactured Cigarettes per adult,
as the population base is different from the OECD source diffrences can be expected.
7. « Country with a ban on tobacco advertising

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Appendix 3 Literature Search

3.1 The Conclusions of Reviewers of the Empirical Literature Regarding the Impact of Advertising on Industry Demand

1. **"The Advertising Controversy: Evidence on the Economic Effects of Advertising"**
   Albion, Mark and Paul W. Farris (1981)
   Boston, Auburn House.

   Albion & Farris offers a summary of the work done on the issue of industry demand - or 'primary demand' to use the terminology in the classical work of Borden (1942). After a discussion of the evidence, the authors conclude:

   > *"Our opinion based on the literature review is that the effect of advertising on primary demand or on the allocation of consumer spending across industries is severely limited by the other economic and social forces affecting the size of the market. In the face of negative forces, advertising can probably do relatively little to counteract the decline of a market. In the presence of strong growth trends, advertising may accelerate the growth rate, but it remains to be shown that it is a significant factor in determining the ultimate size of an industry or market."*

2. **"Economics of Advertising"**
   B. Chiplin, B. Sturgess, J.H. Dunning
   Holt, Rinehart & Winston 1981.

   This study of the literature and studies available on the issue of the role of advertising in stimulating total demand and demand for particular goods and concluded:

   > *"The casual relationship between advertising and aggregate demand is still a matter of considerable controversy, but the latest careful research using sophisticated estimation procedures does tend to suggest that any casual effect is rather weak. Thus it seems to remain unproven that advertising had led to any marked increases in aggregate demand in general..."*

3. "US Federal Trade Commission Bureaus of Consumer Protection and Economics Study" 1985

This extensive Government survey of the literature concerning the general effects of advertising reached conclusions that were further confirmed by similar FTC literature appraisals directed specifically to the drink and tobacco areas (see section 3.2 of this literature review).

"A number of studies use statistical techniques and real world data to test for the effect of advertising on total consumption in each of many industries over a period of a decade or longer. These studies generally estimate the effect of advertising on consumption while using statistical techniques to hold constant the effects of variables such as industry price and consumer income. Because price is held constant, the results of these studies can be interpreted as estimates of the effect of advertising on consumer demand for an industry's product."

"We reviewed the most important of these studies as well as other reports that survey this literature. The large majority of such studies found little or no effect of advertising on total industry demand."

"The principal exception to this generalization is a controversial study by Comanor and Wilson (1974), for which the principal results cover 28 industries during 1948-64. Comanor and Wilson found that advertising had a significant positive effect on industry demand in 10 industries. This study and its results have been widely criticized. One problem is the use of IRS data for advertising expenditures. Grabowski (1976) used different advertising data and found no impact of advertising on total demand."

4. "Advertising Expenditure and Aggregate Consumption in Britain and West Germany: An Analysis of Causality"
Brian Sturgess and Nicholas Wilsohn Managerial and Decision Economics. 1983.

This study of the literature (including an analysis of data from the two countries) concluded that

"No support is found for the proposition that advertising has a positive causal effect on aggregate in the two countries."

3.2 The Conclusions from Reviews of the Available Empirical Evidence Regarding Tobacco and Alcoholic Beverage Markets

1. "Does Alcohol Advertising Affect Overall Consumption? A review of the Empirical Studies"
   Smart, R.G.
   Journal of Addiction Studies on Alcohol, Vol.49, No.4, 1988

   R.G. Smart, of the Addiction Research Foundation of Toronto, found that

   > *"The evidence indicates that advertising bans do not reduce alcohol sales, total advertising expenditures have no reliable correlation with sales of alcoholic beverages, and that experimental studies typically show no effect of advertising on actual consumption."*

2. **US Federal Trade Commission (FTC) Review of the Evidence**
   Recommendations of the staff of the Federal Trade Commission, 1985.

   The FTC's Bureaux of Consumer Protection and Economics undertook a study of the available literature on the impact of cigarette advertising in 1985. They concluded:

   > *"We have reviewed the empirical literature on cigarette advertising and consumption because the cigarette market provides an opportunity to study important issues that are not covered in detail in the general and/or alcohol advertising literature, particularly the effects of an advertising ban and of anti-consumption ads and other forms of health information."*

   "Most of the large number of studies of cigarette company advertising have found little or no effect of changes in total advertising on total consumption. This result is consistent with that for the multi-industry studies reviewed above."

   "For example, according to Hamilton's 1972 review of the literature from the period before the widespread dissemination of health risk information in 1953, early studies found little or no effect of advertising on total demand. Virtually all recent studies reach the same conclusion."

3. **US Federal Trade Commission (FTC) Review of the Evidence**
   Recommendations of the staff of the Federal Trade Commission, 1985.

   The FTC's Bureaux of Consumer Protection and Economics undertook a study of the available literature on the impact of drink advertising in 1985. They concluded:

"Most of the available studies that use real world data fail to find a significant positive effect (of advertising). The same is true for most of the studies that look at the three separate product groups, i.e. hard liquor, beer and wine. That is, most studies dealing with advertising for, say, beer fail to find an effect on the total demand for beer."

4. **"Economics of Advertising"**
   Chiplin, B., Sturgess, B. & Dunning, J.H.
   Holt Rinehart & Winston, 1981.

   The authors examined the research evidence and concluded.

   "Thus it seems to remain unproven that advertising had led to any marked increase.....in the demand for either tobacco or alcohol products...It must be recognised that advertising could well be the wrong target in seeking to curtail consumption of products such as cigarettes and alcohol...it does appear that so far there is little convincing support for the argument that changes in total consumption of these products are caused by advertising. Indeed, advertising appears to have surprisingly little effect on the total consumption of both cigarettes and alcohol."

5. **"Alcohol, Alcoholism and Advertising"**
   Pittman, D.J. and Lambert, M.D.
   St. Louis Missouri
   June 1978

   In a massive review of available literature and evidence they concluded that advertising has not been found to have any significant impact on the behaviour of either youths or adults vis-a-vis drinking behaviour. On the other hand, they did find evidence that advertising influences the brand preferences of those who are already beer drinkers. They quote a 43 percent gain in barrelage of one brewer in 1976 - in a year of extremely small growth in the US beer market.

6. **"The Demand for Cigarettes: Advertising, the Health Scare and the Cigarette Ban"**
   Hamilton, James L. (1972)
   Review of Economics and Statistics, 54, pp.410-11

   Hamilton's review of the literature with respect to advertising elasticities indicates that prior studies showed little consumer sensitivity to advertising. His summary is as follows:

"Schoenberg's (1933) regression advertising coefficient was not statistically significant for 1923-1931, nor was Basmman's (1955) for 1926-1945. Simon (1967) calculated their implied advertising elasticities as only 0.05 - 0.08. Tennent (1950) carefully examined several instances during 1900-1948 when cigarette consumption variations (such as more women smokers) had preceded, not followed, advertising variations. He concluded that the market demand for cigarettes had small advertising elasticity. More recent estimates are few. Though Bass (1969) found significant advertising elasticities ranging from 0.24 to 0.60, his results are suspect. Schmalensee (1972) used similar techniques, and he did not find significant advertising elasticities for 1953-1967. Maier (1955), Sackrin (1962), and Houthakker and Taylor (1970) disregarded advertising."

Hamilton's own findings with respect to elasticities are consistent with the earlier studies. Long-run elasticities were 0.19 to 0.36; short-run elasticities were 0.03 to 0.05 but not significant at the 5 percent level.

7. **"The Economics of Advertising"** Vol. 80
Schmalensee, Richard (1972)
Contributions to Economic Analysis, Amsterdam
North-Holland

This work is notable because it contains a critical summary of earlier work in the period 1933-1071, as well as a careful analysis of the cigarette industry. Papers examined in the summary are those of Schoenberg (1933), Meissner (1961), Nerlove and Waugh (1961), Taylor (1968) and Peles (1971). In Schmalensee's words:

"This fairly exhaustive survey of the literature has not produced an impressive list of positive results. Most single-equation models failed to exhibit significant positive advertising coefficients, in spite of the likelihood that these coefficients were biased upwards. The simultaneous equations models discussed above were not much more empirically satisfactory. A variety of functional forms have been employed, but none performed consistently well."

In presenting his own work on the cigarette industry, Schmalensee observes that he chose this industry because good data exist, and because they are available in the form of the number of cigarettes, so that one has a measure of real sales. The data on cigarettes sold were taken from 'Business Week' and 'Print Ink' and covered the period 1955-1967. Advertising data coming from 'Advertising Age' were deflated to put them into real terms. Financial figures for the producer advertising function came from 'Moody's Industrial'.

Schmalensee rejects the Internal Revenue Service 'Statistics of Income' as being an unreliable source of time-series, due to firms changing their industry classification. This is particularly interesting because the IRS data are used by Comanor & Wilson (1974) in their controversial study, considered elsewhere.

Schmalensee concluded:

> *"In no case did we find any support for an industry advertising effect, and we were even unable to find any significant impact of advertising on the sales of individual firms. In no case was the advertising of other firms a significant variable."*

8. **"Advertising Regulations' Affect upon Demand for Cigarettes"**
   Abermathy and Teel
   Journal of Advertising Vol.15, No.4, 1986

   Abermathy and Teel found that "cigarette advertising primarily affects the market share of individuall brands rather than aggregate consumption..." Informing consumers of the health effect of harmful products seems to be a much more effective means of limiting consumption than the restriction of advertising.

9. **"Alcohol and the Mass Media"**
   Partanen and Montonen
   World Health Organisation Euro Report No. 108, 1988

   Partanen and Montonen of the Social Research Institute of Alcohol studies in Helsinki reviewed the literature concerning alcohol and mass media linkages. They state in their review:

> *"Advertising is generally regarded as a necessary though not sufficient condition for the successful marketing of alcohol, but the existence, and especially the direction of a causal link between the aggregate advertising budget and alcohol consumption remains unproven."*

Appendix 4 Filter Cigarette Penetration Model

Table 7.5.3 of the TSB report illustrates vividly the fact that the average increase in the percentage of filter cigarettes smoked has been highest over the 1971/86 period in countries where tobacco advertising has been allowed. The exception to this rule is shown as those countries with a ban on advertising for political reasons (in other words the Eastern Bloc Countries).

However, the authors of the TSB report have made no allowance for the fact that fast growth rates in any market becomes more and more difficult to achieve as the base level of market share rises. In other words, it is easier to achieve a 50% growth rate when market share is 2% than when it is 20%. And it becomes impossible to achieve a large growth rate when market share is at high levels such as the 80%-98% range which filter cigarette penetration has achieved in so many Western countries.

For example, consider the increases in the following two hypothetical cases:-

Country 1 has 50% filter market penetration in 1970 and hence the maximum possible average annual increase to 1980 is

$$100 \times (100-50)/(50 \times 10) = 10\%$$

Country 2 has 90% filter market penetration in 1970 and hence its maximum possible average annual increase to 1980 is

$$100 \times (100-90)/(90 \times 10) = 1.1\%$$

The existence of this effect is clearly seen if the 'Annual increase %' column in Table 7.5.3 is plotted against the 'Percentage filter-tip 1971' column. (attached)

If we let the values in the 'Annual increase' column be Y and those in the 'Percentage filter-tip 1971' column be X, then the statistic $b = Y/(100-X)/X$ is a measure of how well each country has performed after removing the above effect.

Alternatively, the slope (b) of the line

$$Y = b(100-X)/X$$

gives the same information; the steeper the slope the more the country has achieved after correcting for the market penetration effect.

Analysis of the TSB data shows that the values of b for each group are as follows:-

Group	Slope (b)
Promoted in all media	5.74
Weak ban	4.81
Strong ban	4.36
Total ban - health	4.47
Total ban - political	2.78

The centre three groups are not statistically significantly different from each other, largely due to the small numbers of countries in some groups, but the 'Promoted in all media' and 'Total ban - political' are significantly different. This finding is consistent with advertising increasing the rate at which smokers switch to filter cigarettes and is totally at variance with the statement in the TSB report.

Appendix 5 The Model of Cigarette Consumption

A linear cross-sectional model of cigarette consumption was estimated using OLS regression. The basic form of the model was:

per adult consumption change (%) for country case i =

P x real price change (%) for country case i
+ I x real per capita income change (%) for country case i
+ R x advertising restriction category for country case i
+ constant

The dependent variable of consumption was as given in the 'Health or Tobacco' report in Appendix A, as was the price term and the classification of a country to a particular advertising restriction category. As stated in the body of this submission OECD estimates of per capita private consumption were seen to be preferred as the income term to the data presented in the report.

The constant allows for any general drift in consumption across all countries, and independent of the differential effect of the other influences examined.

The advertising restriction term was a 'dummy' variable to test for the general impact of controls. Three such variables were used:

L1 representing the total ban category

L2 representing the 'few media' category

L4 representing the unrestricted 'all media' category

They are therefore testing the difference between the category they represent and the third category of 'most media allowed'. This was considered the most sound approach as the third category has by far the greatest number of countries and is the best benchmark.

There were 25 observations in all, as Greece and Portugal were excluded because of their abnormal behaviour.

The parameters P and I can be seen to approximate to the elasticities of price and income respectively.

The parameter estimates were as below, with t statistics in brackets:

P = -0.51 (7.08)

I = +0.33 (2.93)

LI = -0.02 (0.05)

L2 = 0.0008 (0.003)

L4 = +0.77 (2.14)

T = 1.32 (3.79)

The overall model diagnostics were:

R squared = 0.79

F (5,19) = 14.1

Clearly the L1 and L2 factors are not statistically significant. The L4 factor is just significant, but this category represents only 3 cases. The non-significant factors were dropped in the final estimate of the elasticities and the Portugal forecast.

The following comments relate ONLY to Tables 7.5.1a and 7.5.1c from the report "Health or Tobacco – an end to tobacco advertising and promotion", by the Toxic Substances Board. They do not imply any conclusions, nor should any conclusions be inferred from them, about the rest of the report.

Table 7.5.1a considers annual average rates of change of adults smoking in a group of 25 nations classified by the degree of tobacco advertising restriction in force.

Before considering the summary statistics presented for the annual % change per group, I would like to take issue with the calculation of the annual % change for each country. Taking the case of Australia, where promotion was banned in most media for 11 years, the % of adults who smoke is reported as dropping from 38% to 33.5%. The actual drop of 4.5% is then expressed as a percentage of the original figure, and this percentage is divided by 11 to get a purported annual % change of -1.1%. Thus a drop of 4.5% over 11 years would be reported as giving a larger annual % change if the actual drop was from 18% to 13.5% than if the drop was from 38% to 33.5%. Yet in both cases the actual number of people giving up smoking is the same. It would be preferable to calculate the annual rate of change directly from the percentages at the start and end of the period. For Australia the annual % change is now -0.4%, rather than the figure of -1.1% quoted in the table. In every case the annual rates are now closer to 0.0% than before.

Turning now to the last column of the table itself I take the grouping of nations as given. The point of most concern is the summarisation of the individual data points of the countries in a particular group by taking the (unweighted) AVERAGE of their values to be representative of the group. This is an extremely non-robust summary, particularly for a group containing few countries. There are several summary statistics that would give give a more reasonable value for each group, such as the median, or an average weighted by, say, the population of the country, or weighted by the length of the period over which the data was gathered. This point is most clearly seen, in Table 7.5.1a, by the first group of countries, those with an enforced tobacco ban, with individual data values of -9.5%, -1.1%, and -0.1%. This group has a median value of -1.1% as opposed to a mean value of -3.6%. It can be seen that the mean value is heavily influenced by the single value of -9.5% for Iceland, a country of 250,000 people, from a survey period of one year.

The results can be summarised in the following table. For each group of countries three figures are given; the group average quoted in Table 7.5.1a, the group average of the corrected annual % changes, and the group medians for the corrected % changes.

Group		
Enforced ban	3 countries	
	Raw average	-3.6%
Corrected range	Corrected average	-1.4%
-3.8% - 0.0%	Corrected median	-0.5%
Promotion in few media	6 countries	
	Raw average	-2.5%
Corrected range	Corrected average	-0.9%
-1.3% - -0.5%	Corrected median	-0.85%
Promotion in most media	12 countries	
	Raw average	-1.2%
Corrected range	Corrected average	-0.7%
-1.2% - 0.3%	Corrected median	-0.6%
Promotion in all media	1 country	
	Raw average	-1.2%
	Corrected average	-0.5%
	Corrected median	-0.5%

It can be seen from the medians of corrected data in the table that there is no consistent trend across the groups. Given the range of values in each of the groups it seems to me that no more elaborate statistical analysis is warranted.

Table 7.5.1c gives the annual rates of change in tobacco consumption per adult of varying time periods in several countries. It can be seen that one of the groups – those with a total ban on promotion – containing four countries contains one outlier – Portugal – whose datum has a strong influence on the group mean. In this table the average annual % changes seem to be correctly calculated, and a summary table analogous to that for Table 7.5.1a is given below.

Group		
Total ban	4 countries	
Range	Raw average	-1.6%
-5.1% - -0.2%	Median	-0.6%
Promotion banned for political reasons	9 countries	
Range	Raw average	-0.4%
-1.8% - +0.4%	Median	-0.3%
Promotion in few media	6 countries	
Range	Raw average	-0.4%
-1.6% - +0.5%	Median	0.0%
Promotion in most media	13 countries	
Range	Raw average	-0.4%
-2.0% - +2.2%	Median	-0.8%
Promotion in all media	4 countries	
Range	Raw average	+1.7%
-0.1% - + 3.5%	Median	+1.1%

As in the preceding table one can see that there is no consistent trend between groups, and that the range of values in each group is wide vitiating any further statistical analysis.

The preceding comments relate ONLY to Tables 7.5.1a and 7.5.1c from the report "Health or Tobacco – an end to tobacco advertising and promotion", by the Toxic Substances Board. They do not imply any conclusions, nor should any conclusions be inferred from them, about the rest of the report.

C.M. Triggs,
Applied Mathematics Division, DSIR.

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